THE IRON TRADE REVIEW

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Larger Orders Increase Production

Sustained Buying and Heavier Specifications Have Marked Effect on Mill and Furnace Operations—Structural Output Steadily Improves—Eastern Makers Aroused by Railroad Administration Order for Pittsburgh Purchases Only

RISING mill and furnace operations clearly denote the sustained improvement in the iron and steel situation. In some mill lines specifications are running well in excess of current output foreshadowing further early contraction of idle capacity. With due emphasis laid upon the absence of railroad buying and its repressing effect upon such heavy products as rails and plates, the present showing of the market is surprisingly good.

Sheets now reflect the expanded buying in that product which since June 1 has averaged 10,000 tons daily for all plants about equally divided between the leading producers and independent makers. In the case of certain producers, however, much of this tonnage was accepted at concessions of $3 to $4 per ton. In lapweld tubes mill books are filled from three to five months. Small pipe, which has been sluggish, is more active. Manufacturing wire continues to fall back on delivery and makers have stopped soliciting contracts.

Rail Order Protested

Eastern steel makers have been aroused by the apparent discrimination against them exercised by the railroad administration in instructing regional purchasing offices this week to buy material from Pittsburgh mills only. This position of the railroad administration is put on the ground that since the eastern mills quote the Pittsburgh base plus the freight to destination the railroads lose the benefit of the haul which they enjoy when orders are filled at Pittsburgh. Eastern producers declare this is fallacious reasoning since it does not take into account the longer haul to their plants on ore, coal and coke.

Predictions are being made by leading eastern fabricators that structural awards for the month will exceed any June on record. This would mean a considerable addition to the May tonnage which for the independent shops was 49 per cent of shop capacity, representing 88,200 tons, a gain of 44,100 tons over April. Lettings of the past week indicate that the release of new work continues on the increase. New York reports 10,000 to 15,000 tons of awards and Chicago at least 10,000 tons. Bids have been asked on the Hanna building, Cleveland, 10,000 tons. Preliminary estimates place the requirements of the Cleveland union station at 60,000 tons and tentative inquiries regarding some of this material have been put before the producers.

Iron Buying is Lighter

After three weeks of an exceptionally heavy buying movement in foundry and malleable pig iron, the market is slowing down. The past week's sales nevertheless have added a large tonnage. Prominent in this was 25,000 to 35,000 tons placed with lake furnaces by the Ford Motor Co. The Standard Sanitary Mfg. Co. bought 10,000 tons additional and a Wisconsin automobile builder also placed 10,000 tons. Many furnaces now are comfortably situated on orders for the balance of the year and some stacks are sold virtually full. Cleveland sellers alone have booked over 300,000 tons since June 1. Several further additions to the list of operating merchant furnaces are being made. The lack of buying of steelmaking iron remains a drag on increased production.

Price concessions in some mill products have been more conspicuous as various attractive orders have appeared. Apart from the shading in sheets, light rails have been cut up to $8 a ton with the claim that the steel was of second quality; semi-finished material continues available at $1 to $2 off the regular schedule; and strip steel, coated nails and rerolled bars show a considerable range.

Get British Orders

British steelmakers continue to view with alarm further invasion of their home market by American steel. A tonnage of plates was sold at London at $94.80 per ton or $14.40 per ton under the British mill price. Another reduction of $2 to $4 in freights to the United Kingdom by the shipping board has increased their uneasiness. Export orders from the Far East and South America continue to expand. China has been buying liberally. One house has closed for 22,000 tons of rails for that country since Jan. 1 and has a new inquiry for 20,000 tons additional. A bridge over the Danube, 12,000 tons, is before American producers.

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Europe's Changed Line-up on Steel

STUDIES of the effect of the war upon the iron and steel industry of Europe have both a sentimental and a practical appeal to the iron and steel producers of this country. Likewise they embrace questions of wide importance to the commercial welfare of all American business. American iron and steel was the barrier which blocked the way of the German armies over the destroyed blast furnaces, steel works, and other industrial plants of Belgium and northern France. Considering the prime importance of iron and steel in modern warfare, it is not pleasant to contemplate what the greatly superior German tonnage might have accomplished, especially in the earlier days of the war had the allies not had the tremendous capacity of the United States to draw upon and the ships to transport freely these sinews of war.

Now Germany defeated is being made to pay tooth for tooth for the blast furnaces, steel works, rolling mills, coal and ore mines and other industrial plants which she so ruthlessly destroyed or wrecked. As a result, an entirely new national line-up of the iron and steel industry of Europe has been brought about and in this the enforced construction of new capacity by the war emergency in various allied countries also has its part.

In the admirable and comprehensive article by A. O. Backert, which appears in this issue, an analysis of the important factors that bear upon the main question of the commercial future of the European industry is given. The author writes with practical appreciaion of the conditions and from intimate contact with the facts enjoyed on a recent trip abroad so that his article is a notable addition to the contributions on this subject. Mr. Backert reaches several conclusions which are of the utmost importance to the American iron and steel industry. One is that Germany virtually is eliminated from the world's export iron and steel field for some years to come, unless she can get raw materials especially from France which seems highly improbable; France with greatly enlarged raw material resources will require some years to convert these to commercial advantage; while Belgium has years of hard work before her before she can even restore her prewar production. There remains among the leading iron and steel producing nations only Great Britain with a considerably enlarged capacity brought about by the war and the United States as the chief sources of supply for the export trade of the world. But the United States must look to the neutral markets for its big trade and not to Europe where the British works clearly will have the advantage. Considering the tonnage which Belgium and Germany, especially, shipped to all points in prewar years, this prospect is quite alluring to the American commercial mind. All those who are indentified in any way with the iron and steel industry and are interested in the overseas expansion of American commerce will find Mr. Backert's exposition of the European situation, of great value at this juncture in world affairs. It furnishes a clear and complete survey of a situation which to be converted fully to the benefit of this country, now and in the future, must be fully appreciated.

Getting Results From Research

AS a result of the war there has come a reawakening of interest throughout the world in scientific research applied to industry. Prior to the outbreak of the great conflict, all of the leading industrial nations, with the exception of Germany, were content to develop their manufacturing and productive processes largely by the hit-or-miss method. The inadequacy of this procedure is now plainly evident and plans for industrial research are developing on all sides. Broadly speaking, these movements are proceeding along three different lines. In the first direction, we find privately-owned laboratories operated by certain corporations for their individual benefit. In the second classification occur co-operative researches maintained by associations of manufacturers and consumers. Finally, we have the

research agencies established by colleges, universities and government bureaus. It is somewhat difficult to evaluate the relative usefulness of these three different forms of research, but it now seems fairly clear that the private laboratory operating in a more or less secret manner for the benefit of a single plant, is the least serviceable both to those who pay the bills and to the community at large.

Research is nothing more than the application of science to industry. Science, however, is founded on knowledge and it has been demonstrated repeatedly that the greatest amount of knowledge is available to the individual under conditions promoting the freest interchange of information. The idea that the world could make progress with all of the knowledge of mankind cornered by a few persons was exploded in the middle ages. It is equally absurd to suppose that any great progress in the application of science to industrial affairs can be made under conditions preventing the interchange of information between the investigators. Therefore, the idea of fostering research for the development of trade secrets is no longer tenable.

Some efforts toward private research may continue to be made, but the real progress of the next two decades undoubtedly will come from laboratories working in the open. Research is of no value to industry unless it produces practical results. Results grow out of knowledge, and under conditions of freest publicity knowledge multiplies geometrically while under other circumstances it barely progresses algebraically. It is conceivable, for instance, that the results achieved by the American Malleable Castings association could have been obtained by one concern, but it is extremely doubtful if the progress realized would have been anywhere near as rapid or the effort as satisfactory without the co-operation of a number of concerns who willingly pooled their knowledge and experience under the direction of a central research bureau.

A number of other instances of the benefits of co-operative research were cited at the recent spring meeting of the American Society of Mechanical Engineers in Detroit. One of the quickest methods of getting tangible results from scientific research, it was pointed out at this meeting by such authorities as Harrison E. Howe, C. R. Richards and others, is to organize a research association in which producers and consumers alike are interested, to the efforts of which all are contributors and in the results of which each member shares equally.

Co-operation, New Zinc Policy

MAKERS of individual classes of roofing material might do well to see if their powder is dry and their rifles in order. The American Zinc institute, a national organization comprising zinc ore producers and smelters, decided at its annual meeting in St. Louis last week to develop the field for zinc consumption. It set aside $25,000 for research and advertising purposes the coming year and expects to increase this appropriation substantially in following years. The leaders of the industry pointed out that the biggest potential field for increased use of zinc lies in the use of sheet zinc for roofing purposes, included roofing, cornices, gutters, etc.

The institute plans a campaign of education among architects, builders and the public generally to the qualifications of sheet zinc for roofing purposes. It was only a short time ago that a zinc foundryman, of Joplin, Mo., in the heart of one of the biggest zinc mining districts of the world, conceived the idea of roofing a new building at his plant with zinc shingles. He experienced a considerable difficulty in finding a manufacturer of this product, although there are several, showing the need for more advertising. The institute proposes to remedy this situation. The sum set aside for this year is small, but co-operation in an industry it has been proved is most effective. This long has been needed in this industry.

Strong Faith in the Future

RECENT announcements of decisions to build new steel plants, or to extend those already existing, have aroused some curiosity in the iron and steel industry generally. In view of the difficulty which has been encountered in recent months in securing enough orders to maintain operations, even at a low percentage, there is a feeling, at least among sales officials, of admiration of the hardihood and courage of those now who are making large investments to create new capacity.

In some instances, it is found that the new plants are designed to produce finished products in order to provide an outlet for ingot production which is in excess of present finishing capacity. In others it is proposed to turn out lines which are related to those already produced, or which the companies involved consider that they are in a good position to market. In other instances, projects to erect new plants originate with individuals who know the business and have or are able to obtain the capital.

Whatever the causes of each individual decision to proceed with the construction of a new plant, all these projects have one thing in common. They all reflect a feeling of confidence in the future of the industry, the future of the country and the future of the world. That the war left a huge iron and steel capacity with a greatly reduced volume of orders, and that peace demand still is far below that required to fill existing capacity, does not appear to worry those whose money is going into the new plants. Their attitude is that demand in the years to come is going to be big enough to keep new capacity busy.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 1728 AND 1730

Pig Iron

Bessemer, valley	$27.95
Bessemer, Pittsburgh	29.35
Basic, valley	25.75
Basic, Pittsburgh	27.15
Basic, delivered, eastern Pa.	25.50
Basic, Buffalo, furnace	25.75
Malleable, Pittsburgh	28.65
Malleable, Chicago, furnace	27.25
Malleable, Buffalo, furnace	27.25
Malleable, delivered eastern Pa.	30.00 to 31.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No 2 Southern	2.25 to 2.75
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X eastern	2.75 and up
No. 1, Chicago	2.25 to 2.75
No. 2 foundry eastern	1.75 to 2.25
No. 1X, eastern delivered Phila.	$29.00 to 31.00
No. 1 foundry, Chicago furnace	28.00
No. 2, foundry valley, Pittsburgh	28.15
No. 2 foundry, Buffalo	26.75 to 27.00
No. 2 foundry, Cleveland furnace	26.75
No. 2 foundry, Ironton furnace	26.75
No. 2 foundry, Chicago furnace	26.75
No. 2X, eastern del., Phila.	29.00 to 30.00
No. 2X, eastern, N. J. tidewater	28.60 to 29.35
No. 2X eastern, Boston	29.90 to 30.90
No. 2X foundry, Buffalo furnace	28.00
No. 2 foundry, del. Philadelphia	28.00 to 29.00
No. 2 foundry, N. J. tidewater	28.10 to 28.60
No. 2 southern, Birmingham	25.00
No. 2 southern, Cincinnati	28.60 to 28.85
No. 2 southern, Chicago	30.00
No. 2 southern, Phila.	31.50
No. 2 southern, Cleveland	30.00
No. 2 southern, Boston	33.00 to 34.00
No. 2 southern, St. Louis	29.00
Virginia, No. 2X, furnace	26.50
Virginia, No. 2X, Philadelphia	30.60
Virginia, No. 2X, Jersey City	31.90
Virginia, No. 2X, Boston	31.20 to 32.20
Gray forge, valley, Pittsburgh	27.15
Gray forge Buffalo	25.75 to 26.00
Gray forge, eastern Pa.	27.50 to 28.50
Silveries, 8%, furnace	40.25
Ohio Silveries, 8%, Chicago	44.05
Tennessee Silveries, 8%, Chicago	44.05
Low phos. standard, Phila.	41.00 to 42.00
Low phos. Lebanon, furnace	35.00
Low phos. standard, Pittsburgh	40.00
Charcoal, Superior, Chgo., last half	31.45

Coke

(At the ovens)

Connellsville furnace	$4.00 to 4.50
Connellsville foundry	4.75 to 5.25
Pocahontas furnace, nominal	5.50 to 6.00
Pocahontas foundry, nominal	6.00 to 6.50
New River foundry, nominal	7.50 to 8.00
New River furnace, nominal	7.50
Wise county furnace, nominal	5.00 to 5.50
Wise county foundry, nominal	6.50 to 7.00

Ferroalloys

Ferromanganese, 80 per cent, delivered producers' price	$110.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic ports.	121.00
Spiegel, 16 to 20 per cent furnace, spot	30.00 to 32.50
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 90.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	49.75
Bessemer, ferrosilicon, 11 per cent	53.05
Bessemer, ferrosilicon, 12 per cent	56.35

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	$36.50 to 38.50
Open-hearth, Philadelphia	42.50
Open-hearth, Youngstown	36.50 to 38.50
Bessemer, Pittsburgh	36.50 to 38.50
Bessemer, Youngstown	36.50 to 38.50
Forging, Pittsburgh	51.00
Forging, Philadelphia	55.00

SHEET BARS

Open-hearth, Pittsburgh	$40.00 to 42.00
Open-hearth, Youngstown	$40.00 to 42.00
Bessemer, Pittsburgh	40.00 to 42.00
Bessemer, Youngstown	40.00 to 42.00

SLABS

Pittsburgh and Youngstown	39.00 to 41.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c
Structural shapes, Philadelphia	2.695c
Structural shapes, New York	2.72c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.65c
Tank plates, Chicago	2.92c
Tank plates, Philadelphia	2.895c
Tank plates, New York	2.92c
Bars, soft steel, Pittsburgh	2.35c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c
Bars, soft steel, Philadelphia	2.595c
Bar iron, refined, Phila.	2.595c
Bar iron, common, Chicago	2.62c
Bar iron, common, Cleveland	2.52c
Bar iron, refined, New York	2.62c
Bar iron, extra refined, Pittsburgh	2.75c
Hard steel bars, Chicago	2.45c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	35.00 to 38.00
Relaying rails, Pittsburgh	38.00 to 40.00
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	2.45c
Spikes, railroad, Pittsburgh	3.35c
Track bolts, Pittsburgh	4.35c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c

Wire Products

(Per 100 lbs. to jobbers, carloads; retailers 5c more)

Wire nails, Pittsburgh	3.25c
Plain wire, Pittsburgh	3.00c
Galvanized wire, Pittsburgh	3.70c
Barb wire, painted, Pitts.	3.40c
Barb wire, galvanized, Pitts.	4.10c
Cut nails, Pittsburgh	4.445c
Coated nails per count keg, Pitts.	$2.75 to 2.85
Polished staples, Pittsburgh	3.40c
Galvanized staples, Pittsburgh	4.10c

Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	6.50c
Sheet piling, base, Pittsburgh	2.55c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 5.65c.

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Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.15c to 4.35c
No. 28, bessemer, Pitts.	4.15c to 4.35c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.50c to 5.70c
No. 28, bessemer, Pitts.	5.50c to 5.70c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.35c to 3.55c
No. 10, bessemer, Pitts.	3.35c to 3.55c
No. 10, open-hearth, Chi.	3.82c
No. 10, open-hearth, Phila.	3.795c

Full sheet schedule page 1588.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

	Black	Galv.
Base, Pittsburgh	Per cent off	
¾ to 3 in., butt, steel	57½	44
¾ to 3 in., butt, iron	39½	23½

Full pipe schedule page 1588.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40½
Iron, 3½ to 4½ inches, c. l.	16

Full tube schedule page 1588.

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	$54.80
Six-inch and over, Chicago	51.80
Four-inch, New York	55.70
Six-inch and over, N. Y.	52.70
Four-inch, Birmingham	51.00
Six-inch and over, Birmingham	48.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c
Bands, Pittsburgh	3.05c
Hot rolled strip steel, Pitts. stamping quality	3.05c to 3.30c
Shafting, Pitts., carloads	28 off list

Cotton ties, lots of 1000 to 3000 bundles, $1.72 per bundle, mill.

Cotton ties, 3000 bundles and over, $1.70 per bundle.

Rivets

Structural rivets, Pittsburgh	3.70c
Boiler rivets, Pittsburgh	3.80c
Rivets ⅞ in. and smaller Pitts.	65-10-5 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅝ x 6 inches, smaller and shorter)

Rolled thread	60-5 off
Cut thread	50-10-5 off
Larger and longer	45-10 off

MACHINE BOLTS

(⅝ x 4 inches, hot pressed nuts)

Rolled thread	60-10-5 off
Cut thread	60-5 off
Larger and longer	50-10 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	70-10 off
Cold pressed semifinished hexagon nuts ⅝ in. and smaller	80 off
Gimlet and cone point lag screws	65-5 off

NUTS

Hot pressed, square blank	3.25c off
Hot pressed, square tapped	3.00c off
Hot pressed, hexagon blank	3.25c off
Hot pressed, hexagon tapped	3.00c off
Cold pressed, square tapped	3.00c off
Cold pressed, square blank	3.25c off
Cold pressed, hexagon blank	3.25c off
Cold pressed, hexagon tapped	3.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices June 25, 1919	Average prices May, 1919	March, 1919	June, 1918
Bessemer, valley, del., Pittsburgh	$29.35	$29.35	$32.55	$36.40
Basic, valley, delivered, Pittsburgh	27.15	27.15	32.35	33.15
*No. 2 Foundry, Pittsburgh	28.15	28.15	29.85	34.15
*No. 2 Foundry, Chicago, furnace	26.75	26.75	29.95	33.00
Lake Superior charcoal, Chicago	31.45	31.45	38.70	37.50
Malleable, valley	27.25	28.65	31.85	34.65
Malleable, Chicago	27.25	27.25	30.45	33.50
**Southern, No. 2, Birmingham	25.00	27.35	31.20	33.50
*Southern Ohio, No. 2, Ironton	26.75	26.75	29.95	33.00
Basic, eastern del., eastern Pa.	25.50	28.80	32.85	32.00
**No. 2X Virginia, furnace	26.50	27.50	31.65	33.50
**No. 2X, eastern del., Philadelphia	29.50	30.10	35.10	34.25
Ferromanganese, 80 per cent, delivered	110.00	130.00	187.25	250.00†
Bessemer billets, Pittsburgh	38.50	38.50	42.25	47.50
Bessemer sheet bars, Pittsburgh	42.00	42.00	45.75	51.00
Open-hearth sheet bars, Pittsburgh	42.00	42.00	45.75	51.00
Open-hearth billets, Pittsburgh	38.50	38.50	42.25	47.50
Steel bars, Pittsburgh	2.35	2.35	2.61	2.90
Steel bars, Chicago	2.62	2.62	2.81	2.90
Iron bars, Philadelphia	2.595	25.95	3.005	3.685

	Prices June 25, 1919	Average prices May, 1919	March, 1919	June, 1918
Iron bars, Cleveland	$2.52	2.52	3.16	3.64
Iron bars, Chicago mill	2.62	2.50	2.86	3.50
Beams, Chicago	2.72	2.72	2.89	3.00
Beams, Pittsburgh	2.45	2.45	2.71	3.00
Beams, Philadelphia	2.695	2.695	2.958	3.185
Tank plates, Pittsburgh	2.65	2.65	2.91	3.25
Tank plates, Chicago	2.92	2.92	3.15	3.25
Tank plates, Philadelphia	2.895	2.895	3.155	3.435
Sheets, blk., No. 28, Pittsburgh	4.35	4.35	4.60	5.00
Sheets, blue anld., No. 10, Pittsburgh	3.55	3.55	3.80	4.25
Sheets, galv., No. 28, Pittsburgh	5.70	5.70	5.95	6.25
Wire nails, Pittsburgh	3.25	3.25	3.45	3.50
Connellsville furnace coke	4.00	3.72	4.00	6.00
Connellsville foundry coke	4.75	4.35	4.80	7.00
Heavy melting steel, Pittsburgh	18.00	15.55	14.65	29.00
Heavy melting steel, eastern Pa.	16.50	15.30	14.25	28.50
Heavy melting steel, Chicago	18.00	15.40	15.25	29.00
No. 1 wrought, eastern Pa.	22.50	21.90	24.00	34.00
No. 1 wrought, Chicago	19.50	17.05	17.65	33.50
Rerolling rails, Chicago	21.00	17.45	16.30	34.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

Pig Iron Movement is Less Active

Liberal Selling of Foundry and Malleable Continues But at Slower Gait Than During Preceding Weeks—Ford Motor Co. Buys 25,000 to 35,000 Tons and Wisconsin Automobile Plant 10,000 Tons—Stacks Resume

Cleveland, June 24.—A heavy purchase by the Ford Motor Co., Detroit, for last half has been the outstanding development of another week of active selling of foundry and malleable pig iron out of Cleveland. The buying by this interest is estimated to have amounted to 25,000 to 35,000 tons of foundry iron which went to Detroit and other lake furnaces. While the past week's selling has continued active and has brought the total volume of sales since June 1 by Cleveland selling interests to over 300,000 tons, the market has not been quite so active during the past day or two. Considerable inquiry still is current and there are indications that much buying still is to be done. Three interests booked in the neighborhood of 100,000 tons each during the past three weeks and with the exception of a moderate lot of bessemer for a special purpose, this has been almost exclusively foundry and malleable grades with a little forge included. An inquiry for 2000 to 3000 tons of basic for June-July or July-August shipment to the American Steel Foundries at Alliance, O., is current. While all producers still have iron to sell, some of them are booked practically full at certain stacks and are planning to increase production. Furnace A at Detroit will blow in soon but after a few weeks, the B stack will go out. The McKinney Steel Co. will put in a third Cleveland furnace in the near future. The Dover, O., furnace will resume shortly. Cleveland foundries have been buying in good amount and a fair proportion of the bookings since June 1 have been from these buyers. A local implement castings interest has been figuring on 2000 to 3000 tons of last half foundry. Prices, outside of a few instances of freight absorption, having been holding well to the $26.75 furnace basis.

New England Prices Firmer

Boston, June 24.—In spite of concessions by two Buffalo furnaces, pig iron prices have stiffened materially. A sale of 1000 tons of Virginia 2X (2.25 to 2.75 silicon) was made at $28 furnace. One eastern Pennsylvania producer has raised his price on 2X (2.25 to 2.75 silicon) to $30 furnace, on No. 2 foundry (1.75 to 2.25 silicon) to $29 and on No. 1X (2.75 to 3.25 silicon) to $31, all for immediate delivery. All offers of last half iron have been withdrawn. Business the past week has been mostly in small tonnages. A local printing press manufacturer placed 1200 tons of 2.25 to 2.75 silicon for last half equally divided eastern Pennsylvania, Virginia and Alabama furnaces. Many orders from 200 to 500 tons are reported. One for 300 tons of Virginia 1X (2.75 to 3.25 silicon) for 60 days delivery was placed at $27.50 furnace. A Rhode Island consumer bought 2000 tons of foundry split equally between Virginia and southern furnaces. One southern furnace quoted $25.50 for No. 2 southern (2.25 to 2.75 silicon). A lot of 250 tons of Lake Superior charcoal was sold at $35.75 delivered Massachusetts. One of New England's largest consumers is asking prices on a round tonnage of No. 2 northern for last half. Several inquiries are out for first quarter and there is one offer to buy a large tonnage first half at $3 above the last half price reported. A central Massachusetts textile machinery manufacturer has 15,000 tons pig iron in storage. A Rhode Island consumer wants 1000 tons different grades for last quarter and first quarter. A 500-ton inquiry for special analysis last quarter delivery is out for a Connecticut consumer.

Eastern Buying Tapers Off

New York, June 23.—Buying of pig iron in this district during the past week has been in greatly reduced volume compared with the preceding weeks. It is doubtful whether more than 15,000 tons of foundry in the aggregate were sold with prices practically the same as the week before. Buffalo furnaces took considerable last half business at $25 to $27, furnace, for 1.75 to 2.25 silicon, and at $25.50 to $28, Buffalo, for 2.25 to 2.75 silicon. A Schuylkill valley furnace took at least 5000 tons in this district for last half at $28, furnace, for 1.75 to 2.25 silicon, $29 furnace, for 2.25 to 2.75, and $30.50 furnace, for 2.75 to 3.25 silicon. Prices on 2.75 to 3.25 silicon at Buffalo vary widely. While some furnaces have obtained as high as $29.75, one interest is reported to have sold this grade during the week close to $25. On the whole, however, a stronger tone is noticeable, due to the good-sized tonnages which have been booked by the furnaces lately. A central Pennsylvania maker which recently was selling at $26.50, $27.50 and $29, furnace, for the three principal foundry grades has withdrawn after refusing to take business for delivery more than six weeks ahead. Two Virginia makers are selling only for delivery within the next six weeks, while at least three Virginia producers are out of the market, with the exception of some high manganese foundry which

is being offered for spot shipment by the Virginia Iron, Coal & Coke Co. at full schedule. Sales of the past week included several thousand tons of malleable to a Connecticut consumer at $27.25, furnace, plus a freight rate of $4.70. One round lot of basic also was sold at $25.75, Buffalo. This, however, did not go to a steel plant. Current domestic foundry inquiries are much smaller and do not aggregate more than a few thousand tons. The largest is from the A. P. Smith Mfg. Co., East Orange, N. J., for 600 tons for last half. An unusual development in the market during the past week was the canvassing of New Jersey consumers by a representative of a large Cleveland merchant interest. Some foundry has been offered during the past week by interests which normally employ their capacity to produce basic for their open-hearth furnaces.

Sales Good But Lighter

Buffalo, June 24.—Pig iron sales the past week dwindled somewhat in this territory from the volume of the preceding two weeks. Total sales were less than 50,000 tons it is estimated. One interest reports sales approximating 20,000 tons. Of this aggregate, one lot of 1500 tons of malleable went at $27.25. Two sales of low silicon iron, 1.75 to 2.25, were made at $26.25 furnace, one of 3000 tons and one of 1000 tons. A considerable tonnage of No. 1 foundry (2.75 to 3.25 silicon) was sold at $29.75. A tonnage of higher silicon iron, 3.25 to 3.75, was sold at $31.25. Another interest reports a fair volume of business in 200 to 300-ton lots. This was all foundry of varying grades and was sold at the March 21 schedule plus 25 cents a ton for the lower silicon grades—this being the price change inaugurated by this interest last week. Another maker sold 3000 tons of foundry principally 2.25 to 2.75 silicon at $28, and 1000 tons of basic at $25.75. One furnace, at least, will do little contracting for the rest of the year, having almost sold itself up for that period. Inquiry is very general, but it is for smaller tonnages. One interest reports a 500-ton inquiry and six for 1000 tons of 2.25 to 2.75 silicon, foundry, one of which comes from Canada. Shipments are very satisfactory on existing contracts, though a shortage of empty cars is developing.

Trading Is Much Quieter

Pittsburgh, June 24.—Users of foundry pig iron appear to have covered their requirements for the next few months and with the passing of this demand the market again has lapsed into comparative dullness with small sales predominating. The Standard Sanitary Mfg. Co. has closed on 10,000 tons of foundry iron for its Louisville, Ky., Allegheny and New Brighton, Pa., plants. On the 4000 tons for Louisville, the No. 2 foundry (1.75 to 2.25 silicon) was bought at $24.50 furnace and the 2.25 to 2.75 silicon foundry was taken at $25 furnace. On its purchases for June and July for this plant the company paid $23.70 and $24.70 furnace respectively. On the 6000 tons for its local plants the great bulk of the business was placed at the full market price of $26.75 furnace for No. 2 foundry (1.75 to 2.25 silicon) but as some of the iron was bought in Cleveland and Buffalo the net price to the furnaces located in those centers was less as they were obliged to absorb the freight differential in order to secure the business. A sale of 600 tons of 2.25 to 2.75 silicon foundry to a radiator company at $28 furnace is noted. Transfer of 300 tons of standard basic to a consumer outside of the Pittsburgh district has been made at $25.75 valley furnace. This is part of a 1000-ton inquiry. A broker who has been seeking to buy 1000 tons of basic at $24 valley, has not been successful to date. These transactions comprise the only important ones of the past week although there has been a fair number of small prompt sales, all of which have been at the full market quotation. The situation in foundry iron has been much benefitted by the recent activity and several producers now are well sold up on last half production. Interest in steelmaking grades remains at a low ebb for there are few buyers who have not fair sized stocks while the steel foundry interests, barring those supplying castings to the automobile trade, are not doing much business at present.

Southern Makers Tightening Up

Cincinnati, June 23.—It is reported that the supply of 1.75 to 2.25 per cent silicon iron in the south is becoming scarcer and interests who were willing to take desirable business last week at $24.50 Birmingham basis now want $25. Northern foundry iron is still holding its own and $26.75 Ironton is the quotable figure, although this has been shaded some, and would probably be cut where freight rates are against that district. The Standard Sanitary Mfg. Co. is understood to have purchased a total of 7000 tons of foundry iron for its Louisville plant, all for last half delivery. Rumors have it that $24.50 was paid for the metal, based on an analysis of 1.75 to 2.25 silicon.

Larger Buyers Are Interested

St. Louis, June 21.—Producers and selling agencies of pig iron in this district report very satisfactory conditions. The only notable change over the past two or three weeks has been the increased interest on the part of larger consumers, whereas the smaller melters have been the most concerned. While no large tonnages have been sold, a number of inquiries from the big users are before the market, and it is likely that at least two of these will result in business before the end of this month. The volume of small sales is still heavy, and a greater variety of buying has been noted this week. Producers are more anxious to sell for the third quarter than for more remote periods. Furnaces in the South while willing to sell currently are bullish on prospective conditions and are deferring sales for the last quarter and the first quarter of 1920. Booking of steel plants in this region are larger, and mill schedules show improvement. Manufacturers of specialties are filling their needs in good shape. This is especially true of stovemakers, who have been heavy buyers of both scrap and pig iron during the last 10 days or two weeks. Inquiries from that source this week total from 3500 to 4000 tons. One Quincy, Ill., plant is out for 1500 tons, and a Belleville maker for 500 tons.

Southern Market Strengthening

Birmingham, Ala., June 24.—Southern pig iron producers are abstaining from selling beyond the third quarter except where consumers are willing to pay the price. Inquiries are still numerous and some consumers are asking about iron for 1920. Predictions are being made that iron prices will be higher within 30 days. Sales are not so heavy at present as producers are cautious in taking on additional business. Two or three companies are out of the market completely and the others are selling only to regular customers and in small quantity. The Tennessee Coal, Iron & Railroad Co. will blow in its Alice furnace, in Birmingham, and a little later will start two stacks at Bessemer. Iron on furnace yards is being reduced steadily and within 60 days should have been removed entirely. The quotations are still given around $24.50 to $24.75 for No. 2 foundry (1.75 to 2.25 silicon), and No. 2 southern (2.25 to 2.75 silicon) and $25.75 for 2.75 to 3.25 silicon.

Eastern Pennsylvania Sales Less

Philadelphia, June 25.—Pig iron business was smaller the past week. Sales of all grades totalling 5000 to 10,000 tons made up largely of foundry iron. Low phosphorus business embraced two sales totalling 800 tons of copper-bearing iron at $35, eastern Pennsylvania furnace. Several hundred tons of malleable were sold at $27.25, Buffalo, while other orders in malleable were closed. No basic has been sold and only one eastern buyer appears to be interested in this grade and then only in an indefinite way. This consumer does not mention the tonnage he wants or the price he is willing to pay. Foundry iron prices are practically unchanged from last week. The minimum appears to be $28, eastern Pennsylvania furnace, on No. 2X (2.25 to 2.75 silicon). A small Virginia interest which has been out of the market for some time has sold some prompt and third quarter tonnage at $25.50, $26.50 and $27.50, furnace for 1.75 to 2.25, 2.25 to 2.75 and 2.75 to 3.25, respectively. The Philadelphia district salvage office expects to take bids shortly for the third time on 3100 tons of standard low phosphorus iron at Burnham, Pa., previous tenders having been rejected. The Leesport, Pa., furnace has been in on foundry and probably will be changed to ferromanganese later.

Buying Full Needs

Chicago, June 24.—Additional evidence that melters of pig iron are gaining confidence in the situation and are convinced that present prices will not be lowered is found in their desire to supplement earlier purchases by additional tonnages. In a number of instances buyers who covered only third quarter have returned to the market and taken iron to meet their requirements for the full last half. Additionally some have asked

quotations for first quarter of 1920, but sellers decline to quote. Inquiry is active and selling is going on at a rate that would be considered heavy except for the vastly larger business done during the war. Inquiry is closed quickly, the total under negotiation at any time thus being comparatively small. Some larger consumers have not covered fully, but are keeping closely in touch to anticipate any movement upward. A malleable interest in Wisconsin covered 1000 tons today. An inquiry for 1500 to 1800 tons of silvery iron has just been put out by a Michigan user. The Studebaker Corp. has taken 2500 tons of foundry iron and a Muskegon foundry 2000 tons of foundry iron from a Detroit maker. A lot of about 700 tons of off-sulphur iron has been covered by a malleable foundry in Wisconsin. Another Wisconsin interest making sanitary goods recently bought 500 tons of silvery and 3000 to 4000 tons of foundry while a motor manufacturer in the same state has closed for 10,000 tons of foundry iron. Southern makers who have been absorbing freight on high silicons continue this policy but only for third quarter. The Alabama Co. and the Virginia Coal, Iron & Coke Co. are said to have withdrawn from the market.

Moderate Sales

Of Iron Ore Are Made—More Mines and Vessels Active

Cleveland, June 24.—Scattered sales of iron ore continue. The moderate level of sales set a few weeks ago has been maintained with marked regularity since. As a result, although sales have not been heavy at any one time, the total is beginning to reach a rather large figure. One seller has closed for 125,000 tons, and expects to book an additional 100,000 tons from negotiations now nearing the contract stage.

Improvement in general iron and steel lines, although not as yet fully reflected in iron ore, has brought about some resumption of activities. A few more mines which have been closed down for several months, have now been ordered into operation and additional lake vessels were placed in commission this week. The Berkshire mine has just been ordered to resume.

The first long term contract for vessel tonnage made this season was closed a few days ago. This was for three years, involving the moving of more than 500,000 tons of ore each season at going rates. Vessel tonnage is still well ahead of demand. The movement of coal is being hampered by shortage of cars at the mines.

Shipments from the Lake Superior district in June will be about 7,300,000 tons. This will be a drop of 2,600,000 tons from the same month last year. Total shipments to July 1 will run slightly above 15,000,000 tons, a decline of more than 4,000,000 tons from the 1918 record.

Ore is now being shipped to the new blast furnaces of the Henry Ford interests at Detroit and of the Weirton Steel Co., Weirton, W. Va.

Buy Last Half Coke Freely

More Sliding Scale Furnace Contracts Are Closed—Eastern Consumers Are Negotiating—Curtailed Output Feared Next Week—Foundries Contracting

Pittsburgh, June 24.—Negotiations still are being actively conducted by blast furnace interests for their last half coke requirements and the number of such deals concluded steadily is growing. One producer has booked last half contracts involving about 36,000 tons a month. This business all was taken on sliding scale contracts at prices running from $4.14 to $4.28, ovens, or at a ratio of 6¼ to 1 and 6 to 1 on basic iron at $25.75, valley furnace. The output of this operator is 70,000 tons monthly, but not more than 50,000 tons of this total will be sold on long-time contracts. Other contracts have been made on sliding scale bases, with a minimum of $4, ovens, while eastern Pennsylvania furnaces have been trying to book coke at a basis of 7 to 1 on the average monthly price of all grades of iron and a 6 to 1 basis when iron reaches $36. Coke operators have not been inclined to close on such contracts. On fixed-price contracts no business has been heard of at better than $4.50, although $4.75 is the minimum of several large producers. The spot furnace market has grown stronger in the past week. The real reason for the restoration of a minimum of $4, ovens, probably is to be found in the fear of reduced output the week of June 30. It is pointed out that Saturday is a payday, while the following Tuesday, the country goes dry and the Fourth of July comes the Friday afterward. Celebrations preceding these events are expected to materially curtail the production. Spot foundry coke is moving steadily from $4.75 to $5, while contracts may be rated from $5 to $5.50, though little recent business has been done at the higher figure. Connellsville production in the week ended June 14, is estimated by *The Connellsville Courier* at 127,095 tons, compared with 117,655 tons in the previous week.

Deliveries on Increase

Boston, June 24.—Coke deliveries continue to increase and new orders for last half and last quarter are being placed. Some large interests have asked for carload lots daily and the New England Coal & Coke Co. reports difficulty in obtaining cars to move its present business. Valve and fitting foundries have been ordering strongly the last week and stove and textile machine shops have kept up their favorable demand. There seems little doubt of an increase on July coke above the $9.40 rate of June.

Active Contract Buying

New York, June 23.—Contracting for beehive foundry coke has reached fairly large proportions recently. Representative beehive interests say that about all their customers have renewed for the last half and in a good many cases for the full year ending June 30, 1920 chiefly on the basis of $5 to $5.25, Connellsville. One company, however, has offered to take contracts on a sliding-scale basis by which the coke producer notifies its customers on the twentieth of each month, of the price at which shipments the following month are to be billed. The consumer is given the right in case the price is unsatisfactory, to cancel shipments for the month involved. The tendency now is to ask $5.25 to $5.50, Connellsville, on standard beehive coke, but the best grades are bringing as high as $6.50.

By-product producers also have been making renewals of last half contracts. On both New England and northern New Jersey by-product foundry coke, June shipments continue at $5, Connellsville, equivalent to $9.40, delivered New England, and $8.10 delivered Newark and other northern New Jersey points. The northern New Jersey maker expects to fix a price of $5.50 Connellsville for July and it is said $5.25, Connellsville will be adopted on New England coke for that month. Some New Jersey by-product coke has been sold for second half to blast furnaces.

Marks Up Virginia Fuel

Cincinnati, June 23.—About the only thing of interest that can be said about the market this week is the practical withdrawal of a producer in the Wise county district by marking up foundry coke to $7.50 ovens. Prices in all other fields also are firmer but no change has been recorded. Connellsville coke is strong, and while some furnace business is reported in other districts no sales have been made lately to nearby consumers. Foundry coke is being bought in limited tonnages for this year's shipment.

More Activity at St. Louis

St. Louis, June 21.—Improvement in the pig iron situation has been matched by coke, the market for the latter displaying more strength and activity than at any time since the armistice. Some excellent inquiries were before the market this week, ranging from 200 tons to 3500 tons, the latter coming from a foundry interest in the St. Louis district proper. Reiterated rumors of coal shortage have served to stimulate melters to provide for their coke requirements. Shipments are coming along in fair shape. Melters find difficulty in accumulating stocks.

Improvement Noted in South

Birmingham, Ala., June 24.—Improvement in coal and coke output is noted in Alabama and producers are confident that a change for the better is in sight. Some of the smaller coke producers are starting up beehive ovens again and others are being speeded up. The by-product coke oven plants are gaining a little also. Coal production in this state has got up to around 275,000 tons a week.

Buy Shell Scrap Freely

Government Tonnages Being Absorbed in all Districts—$18 to $19 Paid —24,000 Tons of Billets Offered—Market Moving up

FOR COMPLETE SCRAP PRICES SEE PAGE 1730

Philadelphia, June 24.—Nearly all grades of iron and steel scrap continue to advance in this territory. This is due to more indications of willingness on the part of the users to buy and a less willingness on the part of the dealers to sell. The Midvale Steel & Ordnance Co. did something in the past week which is entirely novel in the scrap trade here. It sent out a general inquiry for heavy melting steel. Although large sales are lacking there is a large volume of small sales and a heavy business is being done between brokers. One factor in the advancing market is the willingness of consumers to bid high prices on government scrap. They have bid up to $19 delivered on shell steel and $18 on heavy melting steel. Offerings are coming out right along from district salvage offices. The Rochester office is taking bids June 30 on 24,000 tons of billets.

Government Forgings Bought

Boston, June 24.—Increase in the local demand for scrap has sent prices of many grades to higher levels and the market has stiffened noticeably in all lines. Demand for wrought pipe has been heavy during the last week and the dealer's price has advanced nearly $1 at Boston, recent sales having been made at $15 for 1 inch diameter and larger. Cast-iron borings also have been affected by the general stimulus and a carload for special use was sold at $11.50 to a local dealer. The government opened bids June 20 for 2500 tons of shell forgings on hand at Pawtucket, R. I. There were 14 bidders including western steel interests and New York and Boston dealers. The contract was awarded to a Boston dealer at $16.64 f.o.b. Pawtucket. This is above the market price and is about $1.50 above the bid of Midvale Steel & Ordnance Co. The demand for scrap from open-hearth furnaces still is low and prices of steel scrap remain unchanged.

Pittsburgh Consumers Interested

New York, June 23.—Prices in the local scrap market continue strong, and in heavy melting steel quotations are about 25 cents higher. Activity still is centered principally in heavy melting steel, borings and turnings, although there is also a fairly good demand for wrought scrap. A feature of the demand at this time is the interest being manifested by Pittsburgh consumers. No tonnage of consequence has been purchased by these interests, but several good inquiries for heavy melting steel are current. Some sellers state they would accept nothing under $18, delivered, for Pittsburgh delivery, while others assert $18.25 would be the lowest. One large Pittsburgh consumer a few days ago bought 9000 tons of steel in his local market at $18.50, delivered, and then reduced his offer to $17.50. Several large shell tonnages are being disposed of at eastern plants. One lot involved about 8000 tons of forgings at the plant of the New Home Sewing Machine Co., Orange, Mass., which went to Briggs & Turivas, at $17.26, f.o.b. plant, per gross ton. Bids on another lot of shell scrap, approximately 5000 tons were closed today at Morgan, N. J. Joseph Joseph & Bro. offered the best bid of $17.31½ on the ground. Max Solomon bid $17.41 on cars. Bids on 2000 tons of mixed scrap at the Morgan plant will be closed June 28.

Steel Mills More Interested

Pittsburgh, June 24.—Scrap iron and steel prices here are holding firmly at the recent advances and while the steel manufacturers are slow to meet dealers' price ideas, at least they are more interested in the market. On heavy melting steel they have raised their offers and one steel interest is reported to have bid $17.50. It is believed that others might be induced to pay $18. Actual sales between dealers and consumers still are pretty limited while the buying movement by dealers appears to have abated. The sale of 5000 tons of shell blanks and forgings held by the Westinghouse Electric & Mfg. Co. to a Pittsburgh district dealer is noted at $17.55, while reports from Toronto report the sale of 8000 tons of shell steel at $16.50, Toronto. This latter tonnage if brought to Pittsburgh would stand the owner $21, delivered, or more. The Pennsylvania railroad scrap list for June asks for bids on or before June 27 on 24,450 gross tons of yard scrap. The offerings of yard material include 6000 gross tons of steel rails. Rerolling rails have advanced sharply under strong demands from the makers of concrete reinforcing bars. A sale of 800 tons of rerollers is noted at $22, delivered, Pittsburgh.

Selling in Small Lots

Buffalo, June 24.—There has been a great deal of selling in the scrap market during the past week, mostly in small lots. No sales are reported to local consumers. The latter are interested but not to a sharp degree since mill operations here are not more than 60 per cent. Dealers have not been able to buy directly from the railroads for some time but are holding what they have for higher prices. A feature of the market has been the fact that several dealers who accepted orders some weeks ago, selling short, have found it necessary to offer higher prices to cover than they were paid by the consumer. No tonnages have been sold since the 10,000-ton order of heavy melting steel placed by a local consumer. Government shell forgings amounting to 1500 tons were sold last week to a New York scrap dealer at $17.69 f.o.b. cars Batavia. At Toronto Saturday bids were closed for 7255 tons of open-hearth shell forgings and open-hearth solid slugs at the British Forgings, Toronto. The Toronto district salvage board Monday sold 6608 tons of 5½-inch gothic square open-hearth billets.

Still Is Sold Higher

Cleveland, June 24.—Following its advance last week iron and steel scrap in the Cleveland market has been more or less quiet this week. Melters evidently accept the declaration of dealers that they must pay more for their scrap in the future, and considerable melting steel has been sold at $18 and $18.50. Turnings have been going in fair volume to the Pittsburgh district, at a price equivalent to $10 to $10.50 here. Some scrap still is being thrown down, but supplies now coming on the market are too high-priced, as a general rule, to throw down. Producers of scrap are more willing to market their accumulations, but have fancy price ideas.

Chicago Market Climbs

Chicago, June 24.—Better feeling continues to be evident in the market for iron and steel scrap. In addition to being felt it is being acted on by buyers, though it has not brought about a full buying movement. Purchasing agents as a rule are following the upward tendency but are not yet willing to offer a price equal to the general market level. Each sale in the present state of the market seems a signal for an advance and many grades have been adding $1 a week recently, while some have advanced even more rapidly. The supply is not excessive and consumption is on such a scale that it is being taken in readily. A case in point is the recent transfer of more than 20,000 tons of shell scrap which was taken by two open-hearth plants. Malleable scrap and cast are both in demand and the supply is not large. Railroad offerings are moderate and excellent prices are being paid. The Rock Island offers 3550 tons, including 500 tons of No. 1 steel rail, the Southern 2925 tons, including 500 tons of rerolling rails and the Burlington 580 tons.

Undertone is Strong

Cincinnati, June 23.—As far as transactions are concerned the scrap market is marking time to a certain extent. There is a considerable amount of scrap moving, particularly wrought scrap. Quotations on all grades continue to firm up and a buying movement of any size would send the market much higher. There does not seem to be much of a demand for steel turnings but cast borings are getting scarcer, both on account of the ready sale for them, and also to the curtailed production here. There is a little better call for malleable but no recent sales of consequence are noted.

Dealers Continue to Buy

St. Louis, June 21.—With rolling mills and other leading industries still holding aloof from the market, prices of iron and steel scrap continue to advance in this district. Virtually

all items in dealers' lists were jacked up another notch or so during the week and the buying movement is of well-defined proportions. As has been the case since the first of the month, however, purchasing is confined almost exclusively to dealers and yardmen, and a large percentage of the material so acquired is being thrown down, to be held for higher prices. Railroad offerings this week were confined to a few scattered lots. The 1100 tons of shells from the Curtis Mfg. Co.'s plant, offered by the government, brought out stiff competition among bidders, and were sold to a St. Louis dealer at $18.08 per gross ton, f.o.b. the Curtis plant.

Dealers Are More Confident

Birmingham, Ala., June 24.—Confidence is expressed by dealers in an early improvement in old material, in fact quotations are tending higher and several grades are in demand. Inquiries are being received from various consuming centers of the South and offers in stove plate, cast and wrought have been refused. Heavy melting steel consumers insist on making their own prices and dealers are not anxious to sell. Country scrap is still hard to obtain. Industrial and railroad scrap is not as plentiful as had been thought.

Light Rails

Being Sold at Sharp Concessions—Chili Wants 600 Cars

Pittsburgh, June 24.—Current demands for rails and other track material are providing no tax upon capacity. While some fair-sized foreign orders for standard rails are being booked, domestic demands are confined entirely to tonnages for repair work. More inquiries are coming out for light sections quite a few of them from foreign sources but actual business still is small. Some irregularity is noted in light rails with those rolled from shell steel offered as low as 2.05c Pittsburgh. Specifications for small spikes are good but not much is moving in standard spikes although the Baltimore & Ohio has put out an inquiry for more than 5000 kegs.

Some Buying Forced

Chicago, June 24.—Though railroads are still held back by the railroad administration from placing orders for steel and steel manufactures a little buying occasionally is coming through as pressure becomes too great to be held back. The final contracts for the standard steel rails bought by the administration are now being entered and the rails will be rolled between now and Aug. 1. Orders are being placed by railroads for track fastenings to accompany these rails and also for some excess for other track changes. These purchases seem impossible of denial. Light rails are quiet as far as domestic business is concerned but some demand for export is being entertained, especially from Japan, which has been an active buyer. An inquiry for 600 freight cars from the Chilean government is of interest. The Atlantic Coast railroad has issued an inquiry for 100 freight cars.

Sheet Orders Run Large

Average for June to Date 10,000 Tons Daily—Price Concessions Reach $3 to $4—Valley Operations Improve

Pittsburgh, June 24.—A further and substantial increase is noted in the orders and specifications for sheets, which, during the first three weeks of this month, averaged about 10,000 tons daily for the entire industry. Actually, business has been running considerably in excess of present operating capacity and some of the mills now are booked from two to three months ahead, since operations are around 70 to 75 per cent while orders and specifications have been running close to 100 per cent of capacity. This fine showing, however, has not been without its drawbacks, as it is a fact that several manufacturers have been making concessions of from $3 to $4 a ton on black, galvanized and blue annealed sheets in their endeavors to book business. A couple of valley manufacturers have taken sufficient business at concessions to operate their plants practically 100 per cent and a Chicago manufacturer also has become filled up as a result of taking orders freely at well below the regular market level. The basis exists for a quotation as low as 5.50c, Pittsburgh, on galvanized sheets and in black and blue annealed stock relatively as much below the market has been done. The Willys-Overland Co. has not yet covered its last-half requirements. The Ford Motor Co. has changed its method of making purchases. Instead of buying for the season as it did formerly it now bases its purchases on a production of 100,000 cars.

Eastern Business Improves

Philadelphia, June 24.—Sheet business has improved considerably the past week in this district. The leading eastern maker now is operating his mills at 70 per cent. In addition to a considerable tonnage of blue annealed, several good sized orders for galvanized sheets were placed during the week.

Mills Are Filling Up

Youngstown, O., June 24.—Sheetmakers throughout the valley report a good business is being done. Production for this week will reach about 75 per cent. Producers were seeking business actively at the beginning of this month but it is stated a large quantity of business is coming now unsolicited. Prices are being better maintained. Some makers are advocating an increase on all grades. One maker already has advanced his price for certain sizes of sheets from 10 to 20 cents per 100 pounds and is closing some business on this basis.

The sheet situation in the valley is approaching the place where mill commitments are in excess of rolling schedules and together with the dropping off of production which is usual at this time of the year due to inventory, mill repairs and the hot weather, makers will soon be in a position where they cannot promise short-time deliveries. In some instances a large part of the bookings were closed at concessions but it is thought enough business is now ahead of these makers to warrant the maintaining of the present price level. Makers feel confident that the wage scale now being discussed by the sheet-mill workers and producers at Atlantic City will be adopted probably this week for the ensuing year on the present basis.

Prompt Tonnage Well Sold

Chicago, June 24.—The leading independent sheetmaker has sold its capacity for the next 60 to 90 days and is unable to book anything for nearer delivery than September to October. Demand continues strong and many consumers who failed to place their requirements find themselves without supplies and are forced to seek elsewhere. Price cutting that was evident recently seems to have passed entirely and the full schedule is being held in practically all cases.

Export Wire

Advanced by Some Producers—Manufacturing Stock Deliveries Fall

Pittsburgh, June 24.—Some of the manufacturers of wire and wire products have raised their export prices on wire and nails. These manufacturers now are quoting plain wire for export at $3.10, Pittsburgh, and nails at $3.50, or 10 and 25 cents, respectively above the domestic levels. Domestic business has improved to such an extent that these manufacturers are fairly independent of foreign business. Specifications from the domestic trade continue considerably in excess of mill operations and manufacturers' warehouse stocks are said to be running down quite rapidly. The wire plants are going at about 80 per cent of capacity. Little talk now is heard of price cutting except on cement-coated nails. On dull and bright nails manufacturers are disinclined to become heavily committed at current prices.

Want No Nail Contracts

Philadelphia, June 24.—Several producers of wire products have instructed their sales representatives to make no further contracts for wire nails.

Deliveries Now Extended

Cleveland, June 24.—Deliveries on manufacturing wire are becoming a more serious question. The leading producer now is not promising shipments on plain wire under 4 weeks while high carbon spring wire is up to 7 and 8 weeks. Some of the independent mills are so filled on this class of business that they are now quoting two to three months delivery. Generally producers are not soliciting contracts although they will accept such commitments from their regular customers and they prefer to book only for shipment at their convenience.

Bar Buying Goes Forward

Contracts and Specifications Being Placed Freely—Implement Trade Coming Out for Reduced Tonnage—Rerolled Material Still Irregular

Chicago, June 24.—Buying of soft steel bars continues, with some increase in volume as the movement goes on, though absence of railroads and agricultural implement manufacturers keeps demand at a much lower level than otherwise would be the case. The latter are looking over the situation and preparing to place orders for materials needed to replenish their assortments, though the outlook for heavy operation is less than usual. That the railroads can remain out of the market much longer seems impossible under the present conditions of equipment and roadbed repairs and these branches of buying are looked to for considerable business in the near future.

Makers of bar iron find demand for this product much better and the going quotation has been advanced from 2.50c, Chicago, to 2.35c, Pittsburgh, the equivalent of 2.62c, Chicago. A trickle of railroad buying has been met and some wagon manufacturers have taken a supply of iron, though other farm implement makers have not come into the market. One mill is scheduled for capacity through July.

Hard steel bars rerolled from rails are slow and some mills are down. Others manage to find some business in specialties. This market is irregular as to demand, depending on the lines of manufacture to which the mills cater.

Mills Fill Up Rapidly

Philadelphia, June 24.—Active buying in steel bars continues the feature of the finished steel market as indicated by the bookings of eastern producers. One large interest a week ago was operating its bar mills 100 per cent and had two weeks of work ahead. Today it is operating at full capacity with six weeks' orders on hand and is asking for instructions from customers as to shipment preferences. Considerable further contracting for the third quarter was done the past week. An important order placed during the past week with the Belmont Iron Works by the Emergency Fleet corporation involved a large tonnage of galvanized steel tie rods and was taken at 4.35c, Pittsburgh. There is a better demand for bolts, nuts and rivets. Activity is lacking in iron bars by reason of the continued strike in eastern plants.

Good Orders on Specifications

Pittsburgh, June 24.—Makers of merchant steel bars here still are getting good orders and fairly heavy specifications, particularly on the smaller sizes. Makers of shafting who take the larger sized bars are not operating heavily at present possibly because of competition from government holdings. Not much demand is coming from agricultural implement interests although a few have signed contracts covering the remainder of this year. Bar mill operations are on a much heavier scale although still far from full. While reports of price concessions still are heard of, they are not as numerous as recently. Concrete reinforcing bars are in good demand and while sales generally are in small lots the aggregate is satisfactory. Higher prices are probable on rerolled reinforcing bars because makers are confronted with a steep advance in old rails. One maker recently paid $22 delivered for 800 tons of rails. While 2.25c mill is as high as has been done in rerolled bars, some manufacturers are asking 2.35c mill. Demand for iron bars is steady. Buyers no longer confine their purchases to immediate requirements.

Contracting Is Going Forward

Cleveland, June 24.—Contracts for steel bars for last half delivery continue to be written by the mills with buyers of all classes, but principally with the manufacturing trade. One contract for 3000 tons this week is noted. Specifications are coming in quite freely and one large independent producer reports that his operations for the first time were up to 100 per cent the past week. Jobbers are placing orders in fair amount. The Master & Mullen Construction Co. has been awarded the general contract for the sewage disposal plant, this city, requiring 800 tons of reinforcing bars. The C. A. Carson Co. has the general contract for a garage on St. Clair avenue, this city, which will take 600 to 700 tons of bars. Irregularity still obtains in rerolled bars. Some makers are holding at 2.25c mill, but in close competition, 2.15c and even 2.10c has been done.

Some Bolt Plants Full

Chicago, June 24.—Orders for bolts and nuts are being booked in excellent volume and one producer in this district has increased his operaiton to 70 per cent of capacity. Some producers whose product goes largely to automobile manufacturers are running 100 per cent. Specifications are being filed in large volume.

Demand Still Improving

Pittsburgh, June 24.—Makers of nuts, bolts and rivets continue to report an expanded demand, both jobbers and consumers showing more desire to cover. Plant operations have risen considerably. Some plants are running full. Prices are better maintained than recently when the need for business was strong and a good many makers were inclined to cut.

Nut-Bolt Askings Numerous

Cleveland, June 24.—While makers of nuts, bolts and rivets in this district are not running to capacity, sufficient orders are being received from day to day to keep them operating upon an 8-hour basis. One large marker here recently completed a large export order for nuts and bolts. Inquiries and orders from diversified lines of industry continue to be received, with automobile, truck and implement manufacturers prominent. The White Motor Co., and the Peerless Motor Car Co., Cleveland, were recent purchasers of these products.

Hoop Demands Not Increasing

Pittsburgh, June 24.—Only a fair demand is coming to makers of hoops and bands and mill operations remain at a low rate. Stocks still are sufficient to take care of much of the business coming out. Makers are holding to 3.05c base Pittsburgh on both hoops and bands but it is believed that this would be shaded on desirable orders.

Shafting Buyers Seek to Cover

Pittsburgh, June 24.—The past week or so has developed a considerable increase in the demand for cold-rolled shafting and beside a greater number of orders, consumers have shown greater interest in their future requirements. Several now are desirous of placing contracts for the remainder of the year. The mills are operating between 45 and 50 per cent.

Chain Demands Much Larger

Pittsburgh, June 24.—Demands upon chain makers are on a considerably heavier scale than they were even as recently as the first of the month and plant operations have increased considerably. The bulk of the current business is in connection with the navy and merchant marine requirements. The base of $6.50 Pittsburgh for 1-inch proof coil steel chain is being closely observed by manufacturers.

Good Tonnage

Of Ferromanganese Sold at $110—Reduced Price Being Withdrawn

Philadelphia, June 24.—Sales of ferromanganese at new $110, delivered, price have totaled 5000 to 8000 tons of which 2000 to 3000 tons were for nearby and the remainder for last half principally and for last quarter. The producer who first instituted this reduction now has withdrawn the $110 price and says that beginning last night, he again is quoting $125. However the situation is confused since another large producer has not withdrawn the $110 price and importers are expecting cabled authorization from British principals to offer at an equivalent price or at about $106 tidewater.

Sharp Price Decline

New York, June 23.—Despite indications of a strengthening tone in ferromanganese a week ago, as reported in last week's issue of THE IRON TRADE REVIEW, a large producer entered some business the latter part of last week at $110, delivered, for 80 per cent metal. This price thereupon was adopted by other producers so that this figure now represents the market. Business which has been done during the past week does not appear to have exceeded 500 tons in the aggregate. Inquiries, however, are more promising and those now current involve about 2000 tons. The largest is for 1200 tons. The last price cabled from abroad on English ferromanganese is $121, c.i.f. Atlantic ports. It still is too early however

for the English producers to have developed a change in their price policy as a result of the reduction by domestic makers.

Spiegeleisen continues to be quoted at $30 to $32.50, furnace, for 16 to 21 per cent metal. Sales during the past week involved very little tonnage, but there is some new inquiry out including one lot of 1000 tons for last half.

Have Lowered Their Prices

Pittsburgh, June 24.—While demands for ferromanganese are more numerous, one of them being for 1200 tons of September-December from the Brier Hill Steel Co., Youngstown, O., and resale material practically has been eliminated producers have reduced prices. Domestic makers now quite generally are quoting $110, delivered, for 80 per cent. It is thought this move may be to forestall English competition. Some inquiries are beginning to come out for spiegeleison and some carload sales are reported at $35, furnace. This price probably could not be obtained on good sized tonnages and the market may be quoted from $30 to $35, furnace, for 16 to 22 per cent.

The market is a little stronger on 50 per cent ferrosilicon, some makers now holding at $100, furnace, freight allowed, while $90 seems to be a fairly general asking price. At the same time, however, no business to speak of has been done here at better than $85.

Makers of bessemer ferrosilicon are holding to a base of $49.75, furnace, for 10 per cent but sales are few at that figure and it is known that a fair sized resale tonnage of 10 to 12 per cent material recently went around $48, delivered Pittsburgh. Electric furnaces are making a strong effort to establish themselves in the lower grades of ferrosilicon. Some are quoting well below the prices of blast furnace producers.

Withdrawing Lower Price

Cleveland, June 24.—About 1500 tons of ferromanganese in small lots has been placed during the past week or so in this district, and one inquiry for 1200 tons for a valley steelmaker is pending. This business has been done at $110 delivered, but producers now are restoring their quotations at $125 although outstanding tenders at the lower figure still are being accepted.

Resale Alloys Gone

Chicago, June 24.—Spiegeleisen seems to be steady at present at $35, furnace, resale material that was a disturbing factor some weeks ago apparently having been absorbed. Ferromanganese is steady at $125, furnace, a recent recession seemingly having been withdrawn. The western furnace is not yet planning to return to production.

Now Owns Patents

The Industrial Electric Furnace Co., 53 West Jackson boulevard, Chicago, now owns all patents covering the Snyder electric furnace, F. T. Snyder, formerly vice president, having left the organization, effective June 1.

Yards Seek Ship Plates

Most Encouraging Outlook for Mills Comes From Marine Work—General Tonnage Still Backward—New Jersey Riveted Pipe Line Awarded

Philadelphia, June 25.—Although plate business is improving this material is the quietest among all finished products and eastern mills generally are operating below 50 per cent of capacity. The greatest promise for business just now is seen in inquiries for ship steel. The Chester Shipbuilding Co. wants the steel for a 14,000-ton vessel while the Cramp yard is seeking the material for a small vessel and the New York Shipbuilding Co. a tonnage for three 7500-ton boats which later may be increased to five vessels. Probably 10,000 tons of material are represented in the inquiries.

Water Line Contract Closed

New York, June 23.—John T. Brady & Co., New York, have received an award from the commissioners of Jersey City, N. J., of the contract for the riveted pipe line to be built from Boonton to Lyndhurst, N. J. The specifications call for riveted steel water pipe, 72 inches in diameter. The new line is to connect at Lyndhurst with the existing system of water mains which supply Jersey City and the new system is to be completed within two years. About 15,000 tons of plates will be required.

Demand Extremely Limited

Pittsburgh, June 24.—No material improvement is shown in the demand for plates although makers of tanks are fairly steady buyers. Shipbuilders apparently are well off in the matter of supplies and pending some word from the Emergency Fleet corporation as to its plans, are not active in the market. There seems to be some fear that plate supplies held by shipbuilders whose contracts have been suspended will eventually come on the market and for a time at least be a depressing influence on prices. Car builders in Pittsburgh are not pressed with business. One car company recently put out an inquiry for 2500 tons but has not closed, probably because the business failed to bring about any concessions. A car-building company recently closed with a Pittsburgh steel company for 2500 tons at the full price of 2.65c, Pittsburgh. A leading producer of oil pipe couplings recently closed with the Carnegie Steel Co. for 1750 tons of plates and skelp at full prices.

Demand is Moderate

Chicago, June 24.—Plates continue less popular than other forms of finished steel, but are feeling the increased demand that accompanies the business revival. Suspended ship tonnages on mill books have been given up as unlikely to be reinstated and probably will be canceled. At any rate they are not being counted as probable tonnages for mill operation. Makers of oil storage tanks and general manufacturers are taking fair tonnages and mills are getting into more comfortable condition each week. Considerable tonnage of ship plates for Japan are said to be ready for placing as soon as the peace treaty is finally signed and much of this business will go to western mills.

More Tonnage

Continues to Move in Tin Plate—No Big Business Expected

Pittsburgh, June 24.—The situation in tin plate still shows a tendency toward improvement. Makers are in receipt of a fair amount of specifications and new orders from the container manufacturers, some of whom underestimated their requirements. Nobody expects, however, that the tin plate requirements for cans for perishable foods will be anywhere nearly normal this year for it is too late now for a really big business to develop. Roofing ternes are in excellent demand and there continues to be an active export business in tin mill black sheets for export to Japan. One company which is getting a considerable amount of this business has found it necessary to increase its daily output by several hundred tons. Tin plate mills are averaging around 65 per cent with the independents and the leading interest running at about the same gait. Manufacturers claim that they are not shading the price of $7 per base box.

Valley Operations Gain

Youngstown, O., June 24.—Steel-plan and finishing-mill operations throughout the Mahoning and Shenango valleys show a decided improvement. The Youngstown Sheet & Tube Co. now is operating its 84-inch plate mill, three skelp mills, nine pipe mills, 12 sheet mills, the 9 and 12-inch merchant bar mills and two blooming mills. The bessemer production at this plant is also heavy. The No. 2 Haselton stack of the Republic Iron & Steel Co. was blown in Tuesday which gives this company four active stacks in this district. All finishing mills of this company are now in operation excepting two units at the Brown-Bonnell plant. The Brier Hill Steel Co. plans to blow out a stack soon. This furnace has been blowing on the same lining for seven years and it is expected the total melt will reach 1,000,000 tons which will be a record for this particular stack.

Tie Orders Are Normal

Pittsburgh, June 24.—Early season requirements of cotton ties are reported to be about normal with ties for June shipment in lots of 1000 to 3000 bundles quoted at $1.72 per bundle of 45 pounds; in lots of more than 3000 bundles at $1.70. The July price will be 1½ cents per bundle higher.

June Awards at High Mark

Prediction Made Month Will Establish Record in Eastern Structural Work —Important Lettings Continue—Cleveland Station Calls for 60,000 Tons

New York, June 23.—That this month will be the best June in the history of the eastern structural industry is the prediction made by one leading New York fabricator today. This opinion is one of the most optimistic so far expressed, although sentiment in the local market of late has been cheerful. It is based on the fact that building activity of the past several weeks has been increasing steadily, and a number of very sizable tonnages are being placed. This improvement is reflected clearly in the recent report of the Bridge Builders and Structural society, which showed an increase in May of 100 per cent over the preceding month. According to the report, bookings last month amounted to 49 per cent or that capacity, or 88,200 tons, as compared with 44,100 tons in April. Included in the larger tonnages to come during the past week are 2700 tons for the Rudolph Wurlitzer Co., New York City. The larger awards include 1800 tons for the new sheet mill of the Eastern Rolling Mills Co., Baltimore, 1500 tons for the new candy factory of Park & Tilford, New York City, 1400 tons for a drydock for W. & A. Fletcher, Hoboken, N. J., and 1300 tons for Pier 30, Philadelphia.

Following is a comparative statement of monthly bookings, as compiled by the Bridge Builders and Structural society:

Month	Per cent	Approximate tonnage
May, 1919	49	88,200
April	24½	48,100
March	17½	32,300
February	12½	22,500
January	12	21,600
December, 1918	29	52,270
November	27	48,700
October	43	77,400
September	60	108,000
August	57	102,000
July	116½	209,700
June	56	100,800
May	60	108,000
April	64	115,200
March	47	84,600
February	55	99,900
January	53	95,400
December, 1917	121	205,200
November	77	138,600
October	61½	110,700
September	29	52,200
August	38	68,400
July	41½	74,700
June	47½	85,500
May	56½	102,000
April	61	110,000
March	68	122,000
February	59	106,000
January	61½	119,000
December, 1916	86	148,000
November	78	134,000
October	77	133,500
September	52½	99,400
August	64	112,600
July	47½	83,600
June	58	100,000
May	80	137,000

Kelly-Springfield Job Let

Pittsburgh, June 24.—Contracts finally have been placed for the new tire plant of the Kelly-Springfield Tire Co., Cumberland, Md. The McClintic-Marshall Co. has been awarded 4000 tons for this plant and also has the option for the remainder of the steel 3500 tons. This job was held up by the war and only recently was revised. The American Bridge Co. has been awarded 2920 tons for three viaducts in Buffalo. Steel fabricators generally are closing on more business than in some time and shop operations are improving. The report of the Bridge Builders and Structural society for the week ending June 14, shows inquiries of approximately 16,000 tons and lettings for that period of 6000 tons to independent shops.

Fabricators Have Small Stocks

Philadelphia, June 24.—All eastern shape makers report an improved demand which is made up mainly of small orders. Current business includes some third quarter contracting but not all makers are accepting future business since they declare they do not know what their costs will be. They point to the advancing scrap market as an indication that costs will not decline. Producers say that the future of the present situation is that most fabricators have steel on hand for only 30 to 60 days' operations and that if the latter were busy or if the large amount of work now being figured begins to be released freely it speedily will impart a great impetus to the structural shape market. Eastern shape mills in some cases are operating at 40 to 50 per cent and in others on a smaller scale.

Station Requires Big Tonnage

Cleveland, June 24.—About 60,000 tons of steel will be required for the union station construction on the public square in this city according to preliminary estimates. In addition to the station proper, the work includes a number of buildings which will be erected to accommodate business houses now located on the site. Some tentative inquiries for the steel for these buildings have been made. The railroads still have a considerable period before declaring whether or not they will take advantage of the new station and until these points are settled, the track layout cannot be determined or construction begun.

Structural interests in the Cleveland district describe the market as being literally full of inquiries for both large and small tonnages. Present business is so active and the future is so promising that a higher price tendency for fabricated material is being noted. The inquiry for the new Hanna building has appeared, for bids June 30. The first inquiry calls for about 7000 tons; 3000 tons will be asked later. The Nickel Plate railroad which a week ago placed 800 to 1000 tons with the King Bridge Co., for Cleveland grade crossings, has closed with the same fabricator for 1500 tons additional.

Building on Increase

Chicago, June 24.—Closing of contracts for building projects continues and the volume is on the increase. Time has been necessary to impress the fact that prices will not be lower but it seems to have sunk in deeply. The Webster apartment hotel at Chicago has been let to the Duffin Iron Co., Chicago, the steel to be furnished by the Inland Steel Co., involving 2200 tons. George A. Fuller Co. has taken the general contract for the federal reserve bank at Dallas, Tex., which will require 1300 tons.

CONTRACTS AWARDED

Kelly-Springfield Tire Co. building, 4000 tons to the McClintic-Marshall Co. with option for 3500 tons more.

Boathouse department of yards and docks, Newport, R. I., 100 tons of the McClintic-Marshall Co.

Shop building for Dilworth-Porter Co., Pittsburgh, 325 tons to the McClintic-Marshall Co.

Three viaducts for the city of Buffalo, 2920 tons, to the American Bridge Co.

Sheet mill for Eastern Rolling Mills Co., Baltimore, 1800 tons, to the Belmont Iron Works.

Candy factory for Park & Tilford, New York City, 1500 tons, to Levering & Gerrigues.

Drydock for W. & A. Fletcher, Hoboken, N. J., 1400 tons, to the American Bridge Co.

Pier 30, City of Philadelphia, 1300 tons, to the Phoenix Bridge Co.

Bridges for grade crossings in Cleveland for Nickel Plate railroad. Original contract for 800 to 1000 tons increased to 2500 tons with King Bridge Co.

Webster hotel, Chicago, 2000 tons, Duffin Iron Works, fabricators, steel to Inland Steel Co.

Additions to plant at Argo, Ill., for Corn Products Refining Co., 614 tons, to South Halsted Street Iron Works, Vierling Steel Co. and Gage Structural Steel Works.

Powerhouse for Armour & Co., Kansas City, Kans., 490 tons, to Wisconsin Bridge & Iron Works.

Powerhouse for St. Louis Mfg. Co., St. Louis, Mo., 314 tons, to American Bridge Co.

Locomotive cab framing for George D. Whitcomb Co., Rochelle, Ill., 115 tons, to Illinois Steel Co.

Federal resere bank, Dallas, Tex., 1200 tons, George A. Fuller Co., general contract.

Northwestern Telephone Co. building, Minneapolis, Minn., 2500 tons. General contract to Lanquist & Illsley, Chicago.

Loft building, Sixth avenue and Forty-first street, New York, 1300 tons, to the Geo. A. Just Co.

Apartment houses, at Third avenue, 103rd street and on West Seventy-third street, New York, 1200 tons to the Heddon Iron Works.

Carpenter apartment, Fifth avenue, New York, 600 tons to Bethlehem Fabricators, Inc.

Hotel, Seneca Falls, N. Y., 300 tons to Belmont Iron Works.

Aurbach candy factory, Long Island City, N. Y., 2500 tons to Belmont Iron Works.

Storehouse, Newport, R. I., 200 tons to Phoenix Bridge Co.

Three buildings for Cleveland Metal Products Co., Cleveland, 700 tons to Fort Pitt Bridge Works.

Office building, John and Williams streets, New York, 2200 tons to the McClintic-Marshall Co.

CONTRACTS PENDING

Hanna office building, Cleveland, 7000 tons, bids be taken by June 30 by John Gill & Son, Cleveland, general contractors. Bids for annex, 3000 tons to be taken later.

Shop addition at Watervliet arsenal, Watervliet, N. Y., 400 tons, bids close June 25.

Office building for Rudolph Wurlitzer Co., New York City, 2700 tons, bids asked.

Structural shop at Boston Navy yard, 1300 tons, contract pending.

Building for Livingston department store, Bloomington, Ill., 300 tons, bids being taken.

Assembly building for Studebaker Corp., South Bend, Ind., bids asked.

Drake Hotel building, Chicago, 500 tons structural steel on reinforced concrete structure, bids taken in July.

Club house, for Social Realties Co., West Forty-third street, New York, 1000 tons, bids being taken.

Addition to Telephone exchange No. 2, Broad street, New York, 1000 tons, bids being taken.

Transfer bridge, Hampton Roads, Va., 200 tons, bids entered.

Pipe Orders

Continue of Large Total—Butweld Mills Sold Up Far Ahead

New York, June 23.—Tube demand is assuming big proportions in this district. A great deal of lapweld business is coming from oil companies, principally for 8, 10 and 12 inches diameters, for Texas and Mexico. Numerous 2000 and 3000-ton lots are being placed and business of the past week included one 5000-ton lot.

Activity in the eastern cast iron pipe market is improving steadily. Although there is little new municipal inquiry, private demand is coming out in increasing volume. Hartford, Conn., closes today on 1100 tons for 36-inch. Export inquiries are numerous but little business is being placed.

Mills Crowded With Business

Pittsburgh, June 24.—Pipe manufacturers still are rushed with demands from the oil producing regions. There is not a manufacturer in this district who is not booked at least three months ahead on lapweld pipe and some of them are sold up four to five months. Lapweld capacity is operating at 100 per cent but in spite of that fact orders are accumulating. Some of the manufacturers have been obliged to turn down desirable tonnages owing to their inability to make shipments as desired. No large lettings of line pipe recently have been placed but the mills are getting a good number of small orders running from 5 to 10 miles of 10 to 18-inch pipe. A report from Texas suggests the possibility of the construction of pipe lines from the lower Rio Grande border around Tampico to the Texas side of the river at Brownsville where loading facilities are to be provided. Demands for merchant pipe steadily are expanding and it is only because most of the manufcaturers are drawing from warehouse stocks that this development has not brought up the operations of the buttweld furnaces.

Small Pipe Picks Up

Youngstown, O., June 24.—A better demand for buttweld pipe has sprung up recently in the valley and good sized tonnages are being consigned to the jobbing trade. Since the beginning of the year, the demand for small pipe has been light but over the past week a marked improvement has been noted.

Some Price Shading Appears

Chicago, June 24.—Shading of $1 to $1.50 in prices of cast-iron pipe is being encountered occasionally in the west. This is being done apparently to obtain desired tonnages to round out shop operation and is of spotty character. Other makers who have been insisting on the full market price have been forced to meet these cuts occasionally. These irregularities, however, have not been sufficient to make the market noticeably weak. Saginaw, Mich. has awarded 300 to 500 tons to the Lynchburg Foundry Co. The United States Cast Iron Pipe & Foundry Co. has 850 tons for Dearborn, Mich. The same producer is low on 1000 tons at Akron, O. Laurel, Neb., has taken bids on 120 tons and Lusk, Wyo. on 500 tons for a contractor's job. Bids will be opened today at Toledo on 1100 tons of 6 and 8-inch.

Southern Plants Increase Met

Birmingham, Ala., June 24.—Cast iron pipe plants in the Birmingham district are beginning to melt iron again in quantity, as orders are much more liberal.

Better Orders

Are Maintained Against Semifinished Contracts—Concessions Current

Pittsburgh, June 24.—Users of sheet bars and billets are specifying more freely against contracts but are not making many outside purchases for the reason that offerings are quite ample. The middlemen still complain that business generally is as slack as it was following the order from the war industries board which made it necessary for semifinished steel to move directly from producer to consumer. These interests have had opportunities to make sales provided they were willing to sell below the prices of the producers. Since this would have involved concessions of from $1 to $2 below the March 21 quotations, it is assumed that the non-integrated plants are getting semifinished material on contract for less than the regular market prices.

Rerolling Billets Placed

Philadelphia, June 24.—Improvement is to be noted in semifinished material. The largest lot placed this week was 1000 tons of rerolling billets. Several smaller sales of similar material were made and there were also some light transactions in forging billets.

Strip Demand Much Improved

Pittsburgh, June 24.—Makers of strip steel in this district not only are getting a substantial number of orders but note that buyers show an increased disposition to cover for the remainder of the year. There is still some shading of prices on both hot and cold-rolled strip concessions the former for the most part taking the form of freight absorptions.

The Nonferrous Metals

Copper Lead Spelter Tin

	Copper	†Spot Straits, tin	‡Lead, New York basis	Zinc St. Louis basis	Aluminum	Spot antimony
June 18	17.87½	72.50	5.40	6.55	33.00	8.375
June 19	18.00	72.50	5.40	6.55	33.00	8.375
June 20	18.00	72.50	5.40	6.55	33.00	8.375
June 23	18.25	72.50*	5.40	6.90	33.00	8.375
June 24	18.25	*	5.40	6.95	33.00	8.375

†United States Steel Products Co.'s price to consumers, dealers and jobbers; future Straits for shipment from Orient after ban, now 52.25c-52.50c, c.i.f. New York.

‡American Smelting & Refining Co.'s price.

*This metal now all sold.

NEW YORK, June 23.—Strength came to nearly all the nonferrous metals except tin on Monday of this week as a result of the announcement that Germany would sign the peace treaty. Especially in copper was the situation thought to be strong on that account.

In tin it was a double day, for in addition to the factor of peace, came the announcement that government regulation of the domestic market was at an end. George Armsby of the tin administration of the war industries board and the war trade board, and John Hughes, chairman of the subcommittee on tin of the American Iron and Steel Institute made the announcement. The action was the result of the selling of the last remaining metal in the stocks bought by the U. S. Steel Products under government direction on behalf of the American trade. As in the announcement of about a week ago, it was repeated that licenses still would be necessary on imports for an indefinite period. How much longer such regulation can be continued, now that the treaty is about to be signed, is a question the trade cannot answer.

The tin market at London has been a little weak lately and was so again today, while the eastern market showed little change. The price of Straits for shipment from the Far East, c.i.f. New York, is nearly two cents higher than a week ago, now being quoted 52.50c and a little under. Tin stocks in the country were said by the authorities today to be sufficient to last until October, so no shortage is likely, since plenty of metal can be imported between Aug. 1 and that time, the former date being the earliest permitted. Any consumers needing metal are told they may inquire of the American Iron and Steel institute, and consumers who have metal for resale, are likewise asked to inform the institute.

Large export inquiry for zinc, particularly from England, has helped that metal lately. However it was weak a few days ago but on receipt of the peace treaty news today again is strong and quoted at the highest figure in many months, 6.90c for prompt to July at St. Louis and 6.97½c for August.

Copper was quoted around 18.25c for July, delivered, today, a gain of half a cent in a week. A fair movement, not so brisk as several days ago, has been going in the red metal lately. At the close today as high as 18.50c was heard. Strikes continue at many of the brass plants, but to offset this factor, labor trouble is threatened at some of the smelters and mines. No change has been made in brass prices the past week.

Lead is strong after weakness at the end of last week that put the outside market under the leading producer. The latter's figure is unchanged. The outside market is quoted 5.45c to 5.50c New York, 5.15c to 5.20c St. Louis.

Banks Arrange Credits for Exports

American Steel Competing in Spain With British—Many Sales Made to Italy are Checked by Import Restrictions—Far East and South America Still Buying Extensively — Ocean Rates are Shifting

NEW YORK, June 23.—Trading in iron and steel products with the Far East and South America continues to grow. While there is no purchasing for future delivery, export agents are favorably impressed by the present activity. Notwithstanding the restrictions on European business Americans still are looking for orders in that direction, and are using their best influence with the political and financial interests to further this objective. The inquiries from Italy have been extremely heavy and in some instances actual orders have been booked for pig iron, scrap and other material only to find that it is impossible to obtain an import permit from the Italian government.

The leading bankers of New York held a meeting last week and an unofficial committee of five is now at work devising some plan whereby European credits may be set up in the United States. This movement is reputed to have the backing of the Morgan group, the Guaranty Trust and other leading interests. According to the tentative discussions some pool or trust is to be created to purchase foreign bonds or other obligations with which credits will be established against which purchases in America can be made. Reginald Ford has just come to New York as representative of Rumanian interests declaring he desires to purchase some $50,000,000 worth of steel provided the credits can be arranged. One of the projects in view is a bridge across the Danube for which approximately 12,000 tons of steel will be needed. If such arrangements cannot be made in the United States an attempt will be made to find accommodation in England and failing there the negotiations will be taken to the continent. Even Germany may come in for a considerable share of this business. The Europeans are in a desperate need but their financial requirements are of primary importance.

Some Business With Europe

While the French market remains dead, reports continue to come describing the French requirements. The shipping board, according to rumor, will sell and allow to be built in American yards about 1,000,000 tons of ships for the French. The immediate French requirements appear to be agricultural implements. It is estimated she needs 51,000 side hill plows, 33,000 plain plows, 56,000 cultivators, 88,000 harrows, 16,000 beet extractors, 36,000 seed drills, 18,000 horse rakes, 53,000 root cutters, 30,000 mowing machines, 115,000 farm wagons, 50,000 rollers, 48,000 hoes, 13,000 fertilizer spreaders, 21,000 winnowing machines, and 32,000 reapers and binders.

Despite the growing possibility of English competition some sales to Spain have been noted during the past week. One house sold Spain 500 tons of galvanized wire, 300 tons of bridge steel, 700 tons of iron bars and 400 tons of steel bars. The wire was sold at $5 per 100 pounds Pittsburgh base and the bars sold at $3 per 100 pounds, Pittsburgh.

Some small tonnages continue to go to Italy despite the irksome import restrictions. The same is true of Belgium where small sales are encouraging to the extent that American material is not yet shut out of that market.

South America and the Far East continue to afford the best markets. The Far Eastern market is showing the results of the admirable development work which has been undertaken there for some time past. The best news of the week was in the purchases made by China. One house reported that it has sold approximately 22,000 tons of rails to China this year to date, which represents probably 90 per cent of the rail business done there. China also has purchased recently 16,000 kegs of nails, 100 tons of sheets, 300 tons of bars, and 150 tons of plates. The house doing the largest business reports that it has sold at least 50,000 kegs of nails in China since Jan. 1, and now has an inquiry for 20,000 tons of heavy rails. Another house sold 10,000 boxes of tin plate, 500 tons of sheets, 750 tons of bars, and 5000 picul kegs of nails to China. There have been received here many inquiries for copper from Australia, China and Brazil. A sale of 200 tons of plates to India is reported. Japan has been taking sheets and bars. A new Jap inquiry for 800 tons of bars has appeared in the market.

Concrete bars, barbed wire and sheets have been sold to South America in considerable quantity. An order for 200 tons of plates has been placed by Porto Rico. One export house which has just established agencies in South America sold there during the past week 100 tons of sheets and 50 tons of mattress wire, and has received an inquiry for 12,000 reels of galvanized barbed wire, or 700 tons, from Brazil.

Rates Up and Down

One of the leading manufacturers of wire products notified export agents June 19 of an export price advance in wire products of 10 cents per 100 pounds and in nails of 25 cents per keg.

While shipping conditions continue normal to the Far East and it is still possible to obtain cargo space without great difficulty, it is reported that rates are due for an advance. From the west coast to Japan it is rumored the rate of $12 a ton is to be advanced to $16, and from the east coast the rate of $20 is to be increased to $25.

The reduction in rates to United Kingdom ports made by the shipping board last week was good news to the exporters. The new rates are $16 on scrap iron, pig iron and car wheels; $18 on tin, spelter, lead billets and copper ingots, and $17 on other iron and steel products. A decline in the transatlantic rates has been promised for some time past. The previous rate was $20, but a conspicuous weakness has existed for many weeks. While the private lines may not hasten to adopt the shipping board rates, the exporters are not finding it difficult to book some freight on shipping board vessels even though they cannot obtain all the space they desire.

Machinery has comprised some of the best of the export business, including such articles as textile machinery and similar industrial equipment. Within the past week or so exporters have been given to understand that the machinery prices shortly will be advanced 10 or 20 per cent. This information has been distributed by one of the most important export houses to its foreign branches.

Britain's Pig Iron Market Strong

Supplies Are Short and Increased Prices Are Easily Obtained in Midland District —American Competition in Finished Material Respected—London Merchant Saves $14.40 Per Ton on Purchase of 3/8-Inch Steel

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 30.

GREAT strength is shown by the British pig iron market, and consumers in all sections are trying to cover their autumn requirements. Sellers have nothing to spare and confidently anticipate better prices when contracts come up for renewal. In the Midland district the last advance easily is obtained, and all buyers undertake to obtain an increase on the current price corresponding additional cost of production. One of the largest Derbyshire firms is quoting £8 ($38.40) for forge iron delivered. This is from 7s ($1.68) to 10s ($2.40) above other prices in the county, but the company is well sold up. Since it has practically withdrawn from the market, the effect of its action has been to add a new element of strength.

The large demand in the Midlands is assisted by the decided revival in the cast-iron pipe trade, which largely centers at the big Derbyshire foundries. The latter all are as busy making gas and water pipes, ranging from 4 inches to 4 feet in diameter. This creates a big demand upon foundry facilities, and partly accounts for the scarcity. This business will tend to increase as large municipal programs of repairs and extensions were suspended during the war. In the Midlands generally pig iron bookings are for small contracts, most firms declining to open new accounts.

In the Middlesborough district it is almost impossible to get iron for early deliveries. The entire production for the next two months is booked. and as furnaces are only working moderately, there is a little prospect of foundry iron of good quality being equal to the home demand for some time. As in nearly every branch of British trade, export business is being neglected, practically all the parcels going out being to meet the requirements of the allies.

In the Barrow district the demand for steel-making irons is quite equal to the capacity of the furnaces in blast. It is understood that makers are to hold a meeting shortly when the policy for July 1 relating to production and prices will be considered. This problem is awkward in view of the labor question, the cost and scarcity of raw material and American competition. If ore supplies were available, it is likely that other furnaces would be put into blast. In addition to the local consumption, heavy lots are being sent to Sheffield, the Midlands and Scotland. Prices of all pig irons are easily maintained. As shipbuilding now is recovering, foundry iron demands for marine castings are expected to increase.

American Competition Respected

In the finished iron and steel trade American competition everywhere is regarded with marked respect. Agents representing American and Canadian firms were in Birmingham recently anxious to make arrangements with local dealers who were to sell their products and some such bargains have been concluded. The material offered comprises bars, plates, sheets and structural steel over a wide range. Further progress has been made in the way of negotiation for American iron, but the event of the week is the offer of a big lot of American 3/8-inch steel at £19 15s ($94.80) c.i.f. London. One of the largest London merchants who also has a large warehouse in Birmingham, has bought a quantity of this and considers he will be £3 ($14.40) per ton better off than if he had taken British steel. London is a big distributing center for Surrey, Middlesex, Sussex and Essex and the British merchant is well satisfied with his bargain. Some surprise is expressed here that Americans can sell so favorably in view of high freights, but transportation cost so often has failed in the past to keep out foreign material, that British manufacturers are prepared to find that their competitors abroad are getting favorable arrangements from shippers, in view of the compact character of iron and steel, its convenience for handling, and the satisfactory tonnage showing.

For the first time since the war a downward movement in steel has to be recorded. In the beginning of May, makers put up the prices of ordinary billets from £12 5s ($60) to £14 10s ($69.60). There was a great outcry at the time, rerollers complaining the narrow margin left no profit. They also were in a position to retaliate, having been shrewd enough to buy heavily in anticipation of the removal of the subsidy. Welsh makers obviously found their business slow, and they have now set up a new price, namely £13 10s ($64.80) at works, instead of £14 10s ($69.60) delivered. This leaves the buyer to pay the carriage, running to about 10s ($2.40) per ton, but he gains by 10s ($2.40) through the reduction.

For various reasons the steel works have not yet got into their full stride.

Although no labor stoppages have taken place in the iron trade, controversy exists at several works, most of which have been passed on for settlement by the wages board. The successive addition of percentages and of merging arrangements have made the calculation of wages a complicated affair, with which only the most experienced clerks and accountants can cope. Some of the ironmasters frankly confess that neither they nor the workpeople know how the amount payable is ascertained.

The tin plate trade has its own labor troubles. It is engaged in a stern fight with America for the neutral markets, yet a conference with workpeople has been arranged for to deal with no fewer than 134 separate questions. Many of these involve demands which the employers consider extravagant, but they fear a flat refusal probably would involve a disastrous strike.

A meeting has been held this week of the British Federation of Iron, Steel, Tinplate and Metal Merchants at the chamber of commerce, London, when a scheme for co-ordinating the policy of the federation was adopted. Included in the 14 points were:

The securing of fullest possible recognition in official, manufacturing and labor circles of the indispensibility of of the merchant to the export, import and home trade; the convincing of manufacturers that they should trade through merchants; to make known to members those cases where manufacturers seek trade directly; to watch tariffs; to promote fair contract conditions between manufacturer and merchant and merchant and merchant; to take steps to discourage contract defaulters; to discourage the question of net terms; to discourage bankers from taking up merchant trading; and to watch freights and railway rates.

Testing Society Meeting

Specifications for Malleable Castings and Open-Hearth Girder Steel Adopted—Election of Officers Announced

Atlantic City, N. J., June 25. (By wire.)—That the work of formulating new specifications and revising old ones has gone forward with renewed impetus since armistice day was clearly emphasized at the opening session of the twenty-second annual meeting of the American Society for Testing Materials at Atlantic City Tuesday. The membership of the society now is 2500 and its activities involve cooperation with nearly a dozen technical and scientific organizations. Revisions have been proposed in four tentative standards, including those for open-hearth steel girders, high T-rails and engine bolt iron. Five tentative standards, including that for malleable castings have been recommended for adoption. Twelve new tentative standards have been proposed.

The election of the following officers has been announced: President, J. A. Capp, chief of testing laboratories, General Electric Co., Schenectady, N. Y.; vice president, C. B. Young, superintendent, Schuylkill division, Pennsylvania railroad, Philadelphia; members executive committee, Ernest Ashton, Lehigh-Portland Cement Co., Allentown, Pa.; Prof. H. F. Moore, University of Illinois; C. R. W. Rys, metallurgical engineer, Carnegie Steel Co., Pittsburgh, and Admiral D. W. Taylor, United States navy.

In his annual address President G. H. Clamer traced the developments of standardization from the days of Whitworth to the present time. He described the pioneer efforts of Franklin institute in 1864 and William Sellers a few years later. He strongly urged that the wartime lessons of conversation through standardization be capitalized during the early days of the peace period.

In the report of the committee on preservative coatings for structural materials special reference is made to the painted steel plates which have been exposed to the weather at Altoona, Pa., and Brooklyn, N. Y., for several years. While some of the panels are deteriorating slightly, the range in the degree of deterioration has not been sufficient to warrant the committee in recommending any particular method of preparing iron and steel for painting. The recommendations of the committee on lubricants which provide for the use of the Say-bolt viscosimeter were adopted by the society.

Tuesday evening a special memorial session in honor of Edgar Marburg, former secretary-treasurer of the society who died June 27, 1918, was held. Memorial addresses were made by John M. Goodell, Upper Montclair, N. J.; Robert W. Leslie, Philadelphia; Prof. Arthur M. Talbot, University of Illinois, and Robert W. Hunt, Chicago.

Otis Announcement Soon

Definite announcement of plans of a Cleveland syndicate which is being formed to take over the controlling interest of the Otis Steel Co., Cleveland, and effect a consolidation of the company with another large Cleveland ore and furnace interest, as previously noted in THE IRON TRADE REVIEW, is expected to be made soon, it has been learned from an authoritative source. Speculation in iron and steel circles has been rife for weeks respecting the final disposition of the Otis control, which was purchased more than one month ago from British owners through negotiations carried on by William Salomon & Co., New York investment bankers.

Will Relight Stack

Chicago, June 24.—The Iroquois Iron Co. will relight one of its stacks at South Chicago early in July, selling of pig iron having been sufficiently large to make its output necessary during the remainder of the year. This and other stacks at this plant have been undergoing repairs during the dull period early in the year.

Orders Railroads to Buy Only Pittsburgh Steel

Philadelphia, June 24.—Eastern steelmakers have been greatly aroused by a letter received yesterday by regional purchasing committees of the railroad administration, signed by Henry B. Spencer, in general charge of purchases, instructing them hereafter to purchase steel only from Pittsburgh mills. This position of the railroad administration is put on the ground that eastern mills charge the Pittsburgh basis plus the freight and the railroads, therefore lose the benefit of the haul from Pittsburgh which results from Pittsburgh orders. Eastern producers point out that not only is the Spencer order a violation of all precedent, but it does not take into account that eastern mills give the railroads a much longer ore, coal and coke haul than the Pittsburgh mills.

Chemical Engineers Meet

Boston, June 23.—At the eleventh semiannual meeting of the American Institute of Chemical Engineers which was held in Boston last week, nearly one-third of the total membership was present. Arthur D. Little, Arthur D. Little, Inc., Boston, president of the institute in an address said that "the country is on the verge of a great era of chemical development." "The future," he continued, "promises progress in the chemical field comparable only to that recently obtained in transportation." This expectant spirit

A number of papers on electric furnace development were presented. C. T. Bragg, Michigan Smelting & Refining Co., Detroit, outlined the future of the electric furnace. "The Utilization of the Electric Brass Furnace," was the subject of a paper presented by W. H. Gillett, bureau of mines, Washington. "Electric Furnaces of the Resistance Type" were described by T. F. Baily, the Electric Furnace Co., Alliance, O. H. M. St. John, Detroit Furnace Co., Detroit, described the rocking electric arc furnace and its application to the melting of nonferrous metals. The Ajax-Wyatt induction furnace was described by G. H. Clamer, Ajax Metal Co., Philadelphia.

Mill Scales Settled

Atlantic City, N. J., June 24.—An agreement on wages was reached here today by the sheet and tin plate manufacturers of the Amalgamated Association of Iron, Steel and Tin Workers. The preamble of the sheet scale of 1918 is retained in the new agreement which grants a 10 per cent increase to doublers, matchers, catchers and pair heaters, and an increase of 6 per cent to heaters' helpers. An extra of 10 per cent for rolling pickle bars was allowed. The 6-hour day was eliminated. A new gage was added to the price list as it was argued that there was too much of a spread between 18 and 21 and 22 and 25 gages. The new gage is 21 to 22 and a base of $7.40 was established. The preamble of the tin mill scale of last year is retained and an increase of 10 per cent is granted to doublers, helpers, catchers and screw boys. Some minor changes in the footnotes were agreed upon and an important agreement was reached on the status of contracts but details are withheld.

Steel Foundry Opened in Wilkes-Barre, Pa.

Engineering Skill and Foundry Experience Utilized in Steel-Casting Shop—One 20-Ton Open-Hearth Furnace Now Installed

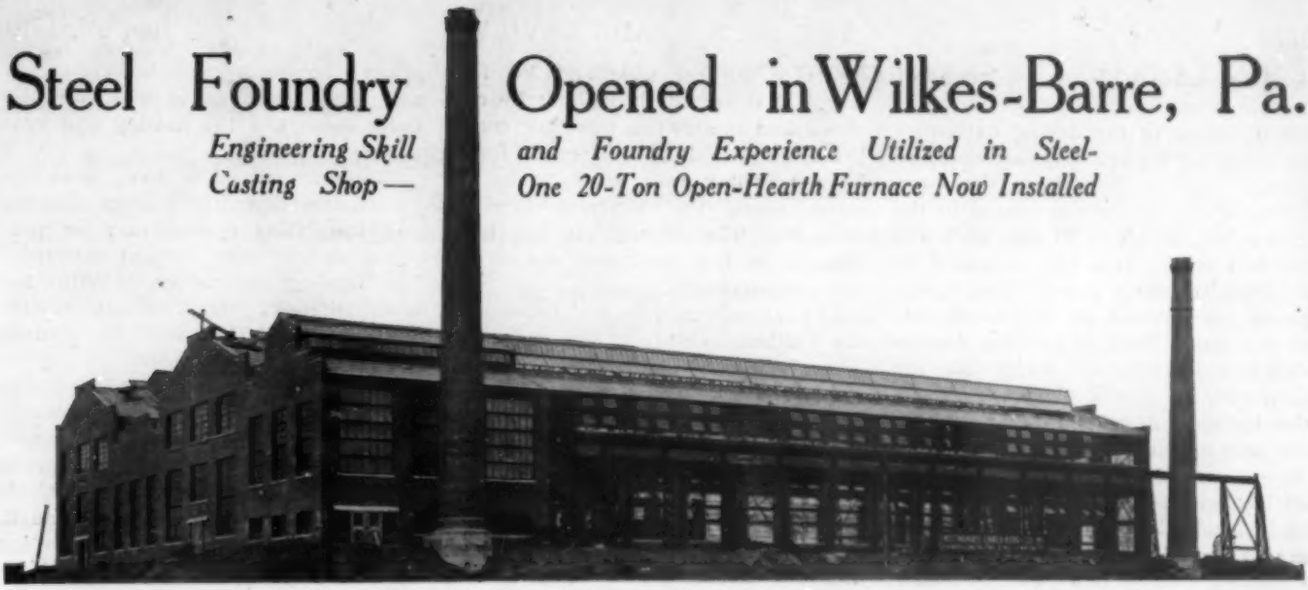


Fig. 1—The Foundry is of Steel and Glass Construction with Two Tall Brick Chimneys, One for the Open-hearth Furnace and the Other for the Annealing Pit

THE Vulcan Iron Works, Wilkes-Barre, Pa., has recently placed a new open-hearth steel foundry in operation in order to take care of the steel casting requirements of the three plants of the company, which are located at Wilkes-Barre and West Pittston, Pa. Before the foundry was designed, a careful study was made of the company's present and future needs for steel castings so that the plant as it stands today is the result of a combination of engineering and practical foundry experience on a progressive basis.

The building has been so designed and located with respect to future construction that its capacity may be increased and extensions made without disturbing the production operations or relocating any of the equipment at present installed. The foundry is built of brick throughout, with structural - steel framework, steel sash and cement-tile roof. The general plan, as shown in Fig. 2, is L-shaped. The building consists of three parallel main bays, running north and south. The foundry yard in which scrap and other materials are stored is located east of the main foundry bay. It is served throughout its entire length by a 10-ton traveling crane. This crane runs into the furnace house and serves the charging floor.

There is one 20-ton open-hearth furnace which is oil fired but has been so constructed that producer gas may be used at some future time. It is provided with a radial brick stack 4 feet inside diameter and 125 feet high. A view of the furnace is shown in Fig. 3.

This furnace is located in a furnace house on the east side of the casting floor at the south end of the main bay. The furnace house is 50 feet wide and 60 feet long. The structural steel has been so designed that this building may be extended to the north and an additional open-hearth furnace installed. All the steel work for the charging floor also has been designed so that the supports are strong enough to support a charging machine should it become necessary or desirable to install one at some future time. The dry-sand molding floor, which is located in the west bay, is 70 feet wide by 180 feet long. It is served throughout by one 10-ton and one 20-ton traveling crane and one 5-ton traveling wall crane located along the easterly line of columns. An 8-foot pan-mill and a 60 x 84-inch molding machine are located in this department.

The sand bins have been placed directly west of the dry-sand molding floor and are at present 80 feet long, but provisions has been made in the construction so that the bins may be extended the full length of the building. The sand is brought to the plant in cars and delivered to a track hopper from which it is carried to the sand bins by means of a bucket elevator and belt conveyor. A pit has been provided at the pan-mill so that the sand may be discharged directly into a bucket which is picked up by the molding floor cranes and delivered to any point desired. This arrangement admits of the rapid handling of

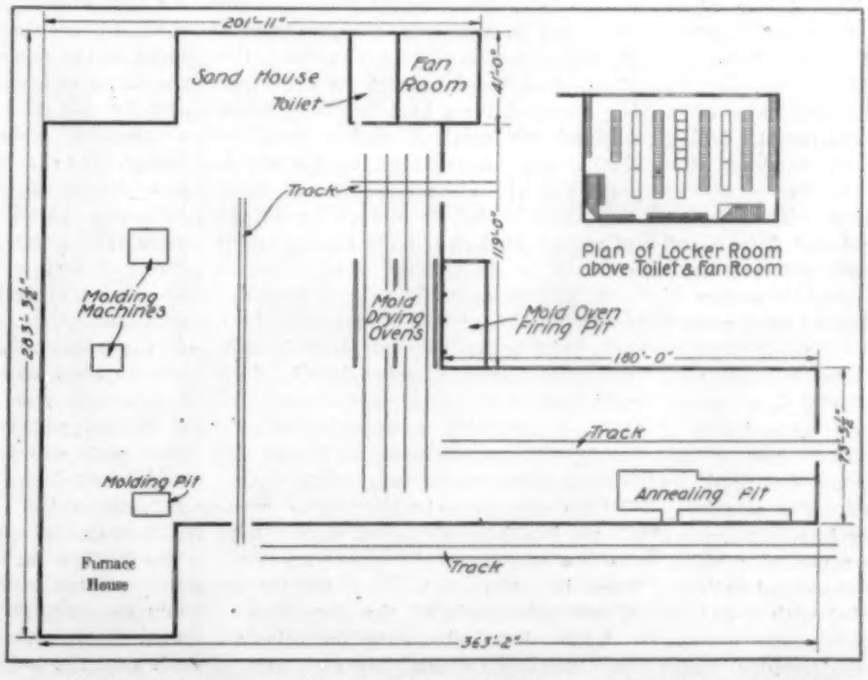


FIG. 2—PLAN OF FOUNDRY SHOWING LOCATION OF FURNACE WITH REFERENCE TO MOLDING AND POURING-OFF FLOORS

molding sand with a minimum of manual labor. The completed molds are delivered to the drying oven cars by means of the molding-floor overhead cranes.

The drying ovens are located in the center bay, which is 50 feet wide and 180 feet long. This bay is served by a 10-ton traveling crane. The drying ovens are located at the north end of this bay. They are of the double-ended type, that is, the molds are delivered to the drying-ovens from the molding floor and taken out on the casting floor through the ovens. There are two ovens; each oven is 20 feet wide, 48 feet long and 12 feet high, inside dimensions. These ovens are so arranged that each one may be separated into two compartments, each compartment being 24 feet long. This division permits of the heating of only half an oven in cases where smaller molds are dried, thus saving considerable fuel. The drying-ovens are fired with coal, from a firing pit conveniently located. This firing pit is at present outside the building in a small lean-to. In the case of a future extension, additional drying ovens will be located north of the firing pit so that they may all be fired from one point. The drying ovens are of the sand-sealed type and are provided with both a forced draft and an exhaust system, by means of which close regulation of temperature may be obtained.

The core ovens have been located directly south of the drying ovens, one being of the car type and one of the drawer type. They are so arranged that they may be fired by either coal or oil fuel. The remaining portion of the center bay is taken up by the core and green-sand molding departments. The green-sand molding department is provided with a 40 x 56-inch molding machine.

The main bay of the foundry, which contains the casting floor, the shaking-out floor and the cleaning departments, is 70 feet wide and 360 feet long. It is served throughout by one 40-ton and one 20-ton traveling crane. Provision also has been made for a 5-ton traveling wall crane to be located along the westerly line of columns. The casting pit has been located in the southeast section of the casting floor.

The annealing pits are located in the northeast corner of the main bay. They include one pit 8 feet wide by 40 feet long and one pit 15 feet square. Both of the annealing pits are coal fired. They are provided with an underground flue leading to a radial brick stack. These annealing pits have been so located that when it becomes necessary to extend the cleaning department it will be located north of the pits.

From the general arrangement it will be noted that the work travels in one general direction without cross movements, the molds traveling from the west to the east, the dry molds through the drying ovens and the green-sand molds direct to the casting floor. After a heat has been taken off and the castings shaken out, the flasks may be returned to the molding floor or to the flask-storage yard, the sand loaded into cars by means of a grab bucket and the castings sent directly to the annealing pit.

FIG. 3—VIEW OF 20-TON OPEN-HEARTH FURNACE IN COURSE OF CONSTRUCTION

A power house has been provided containing four 150-horsepower boilers, built by the Vulcan Iron Works, one 250 kilowatt steam-driven alternating-current generator, one air compressor with a capacity of 200 cubic feet per minute, and one 150 kilowatt motor-generator set.

Like the other buildings the power house has been designed with a view to expansion, and when necessary may be enlarged to care for the increased demands of the shop.

Toilet and locker-room facilities are provided in a 2-story lean-to located northwest of the dry-molding floor. The second floor of the building comprises the wash and locker rooms and the first floor is used for the toilet room and the heating and ventilating plant.

Underground ducts have been installed so that an indirect heating and ventilating system may be provided at any time without interrupting foundry operations. With the installation of this indirect system positive ventilation will be assured both winter and summer.

The new plant was designed and constructed by Westinghouse, Church, Kerr & Co., Inc., New York, in conjunction with S. T. Nicholson, president of the Vulcan Iron Work; C. A. Jackson, general superintendent and B. L. Weaver, steel foundry superintendent.

Leather Belt Has High Overload Capacity

To determine the working capacity of leather belting, Prof. Ernest D. Wilson of the Mellon Institute of Industrial Research, Pittsburgh, has recently completed an extensive series of experiments and obtained important data. In the course of this investigation, power transmission tests were made on two different belt-testing machines at different times and the results checked and combined. The apparatus, which consisted of a motor to furnish the power, a generator to furnish the load, and a device to measure the tension on the belt, insured accurate data.

The tests were conducted by increasing the load on the belt from zero to a point where the slip amounted to at least 3 per cent and the belt showed signs of distress. The control panel was equipped so that the speed of the motor could be accurately regulated and the load applied to the belt by the generator varied through a range of from zero to 100 horsepower. The speed was measured by two electrically operated revolution counters. In all tests the pulleys used were 24 inches in diameter, some crowned and some straight face. In the series of tests on the first set of machines, the belt was run at 3770 feet per minute, while in the series run on the second set of machines the belt speed was varied from 2500 to 5000 feet per minute. Most of the tests were made at 500 revolutions per minute or a belt speed of 3140 feet per minute.

When the horsepower developed was plotted against per cent of slip, the curve showed that at 1 per cent slip the horsepower was 21, at 2 per cent the horsepower was 33, and at 3 per cent the horsepower was 41. This curve was considered a conservative test average.

Italy Strives For Industrial Power

World Witnessing a Plucky Nation's Fight Against Many Disadvantages to Keep in the Company of First-Class Productive Countries—Great Plans Made for Development of Her Mines and Waterpower

BY FRANCIS MILTOUN

Paris Correspondent of The Iron Trade Review

ITALY is about to play a great role in the industrial, commercial and economic reorganization of the world. The engineer, the shipowner, the automobilist, the electrician and some others know this; the time has come for the world to recognize it. Italy is no longer to remain in the second plane. Her prodigious economic development, which began about 1888, is striking evidence of the energy and force of her virile people. Curiously, and not in the spirit of captious criticism, it may be remarked that the northern Italian, practically in the same latitude as the southern Frenchman, is a much more energetic person than his French brother.

The superior development of hydraulic power is one proof of the Italian's greater activity; the development of Mediterranean shipping and the more numerous importing and exporting firms are others. The comparison might be carried out indefinitely. Yet Italy is a country without a ton of coal commercially mined within its borders.

Italy is even less generously endowed with minerals than France, although what the future may develop is still a question. Italy, at all events, has made a great stride forward in the development of her resources and has eliminated superfluous discussion to get down to business.

Makes Remarkable Showing

Previous to 1914 Italy was dependent to a large extent on Germany and England for much of her raw material and manufactured articles, and this notably with respect to the metal trades. Came the war, and for 10 months Italy was shaping her destinies. Even before she joined the allies she put at their disposal practically 1000 factories and 500,000 workmen and women, producing arms and ammunition, airplanes, automobiles and chemicals. Probably another 1000 minor industries and 50,000 additional workers added their mite to the allied cause. Meantime, Italy was exporting about $600,000,000 worth of her own products and importing nearly $1,400,000,000 worth. In 1914 the discrepancy was but $60,000,000, but she was largely paying for these imports by the government work which she was contracting to do for the allies. Her contribution to the common cause of civilization was great.

Since the armistice was signed Italy has made a more strenuous effort to join the company of first-class, productive powers with which she was associated in a military way. German capital and German mediums of exchange have been eliminated; the same with Austrian. The industrial world all through the Italian peninsula has been preparing for the inevitable economic struggle after the war. The preparation was obvious a year ago, soon after the American intervention. Italy having close relations with America understood the real value of American co-operation as did, perhaps, no other power.

Foreign exchange was against Italy from the first day she mobilized her troops on the Venetian frontier, but she did not hesitate to send $26 to France as a guarantee to pay for every $20 worth of supplies she may have needed, and from $1.20 to $1.60 for every $1 of liability she assumed in the United States. This placed Italy in the frame through which she should be viewed today.

The development of a metallurgical industry on an adequate scale was a strenuous undertaking, considering that Italy's iron deposits were so short of development and that she utterly lacked coal. Italy's production of pig iron did not exceed 30,000 tons a year up to 1912. It was about that time the Italian government bought from France the right to manufacture the Deport cannon, the progenitor of the famous "75," and immediately began the manufacture of the cannon on Italian soil instead of having the Krupps do the work. Italy was then making her first effort toward sustaining herself. Now she is working out an economic development which will be the marvel of all those who may consider the Italians only as a nation of mandolin players.

The creator of the Italian steel industry was Signor Benedetto Brin, former minister of the Italian marine, who during his ministry was the first to suggest that Italy build her steel merchant ships and battleships at home instead of buying them abroad. Aided by another industrial leader, Signor Breda, Brin created the Martin Steel Works, at Terni, which began operations in 1886, using the lignites of Spolete, in the absence of a home coal supply, gasifying them in gazogenes and supplementing them with hydraulic power from the famous Cascade delle Marmore, formed by the torrent of the Velino, the same whose charms were sung by the poet Byron. This waterfall produced 130,000 horsepower, of which the Terni works used 10,000.

The iron deposits of Elba, Napoleon's isle, were at the time yielding 500,000 tons and the balance of the ore needed for the beginnings of Italy's steel industry, 400,000 tons, was bought abroad. The statistics of 1913 show this plainly, only 427,000 tons of pig iron having been produced in the peninsula, while the production of rails and armor plate totaled 846,000 tons.

The state steel works of Terni never had a particularly brilliant financial history but they were the nucleus of a flourishing industry, as demonstrated by Italy's work in the war. In 1902 the Society Siderurgic of Elba, established in 1889 at Portoferrajo, on the island, was sold to the Savona society, a branch of that of Terni, and in 1916 this group alone made $2,000,000 in profits.

An agreement signed in 1911 united the factories of Nagona d'Italia, at Porto Vecchio, the Piombino and the Ilva works to that of the Savona branch of the Terni group and also with that of Sestri Ponente and of Voltri. In reality this *cartel* formed a trust, with the controlling powers in the hands of the Ilvan society, whose products are marketed by the Societa Ferro e Acciaio, at Milan.

Home Markets in Need

The metal trades *per se* have a considerable home market for their products in Italy's growing merchant and naval fleets and the elaborate railway system of the peninsula, to say nothing of the intensive development of urban and interurban and mountain electric railways, and the automobile industry. To the government navy yards at

Spezia, Venice and Taranto must be added numerous private shipyards at Genoa, notably that of the Ansaldo company which owns the Cornigliano-Ligure steel plant, the whole vast fabric under control of Signori Pio and Mario Perrone, forming one of the most highly perfected industries of its class in Europe, producing nearly everything in its line from armor plate and artillery to automobile parts. The steel plant of this single establishment is producing 300,000 tons of finished products per annum.

The English firms of Vickers and Armstrong are interested in naval works and artillery plants at Pouzzoles, Spezia and Livorno, while still other foreign interests are installed at Naples and in other Italian ports, Orlando, Livorno, Odero and Sestri Ponente.

For the development of home shipbuilding interests, the leading Italian navigation company founded in 1916 the Maritime Credit bank with a capital of $20,000,000. This in its operation, is independent of the company's various shipyards working on their own account.

At Genoa and Milan are found the locomotive and car shops of the Ernesto Breda Co., which since the war, in addition to its regular output, has specialized on aviation motors, cannon and ammunition. Its net profits in 1916 exceeded $600,000 and the Officine Mecchaniche, an auxiliary, made nearly $800,000 during the same year.

Proud of Its Automobile Industry

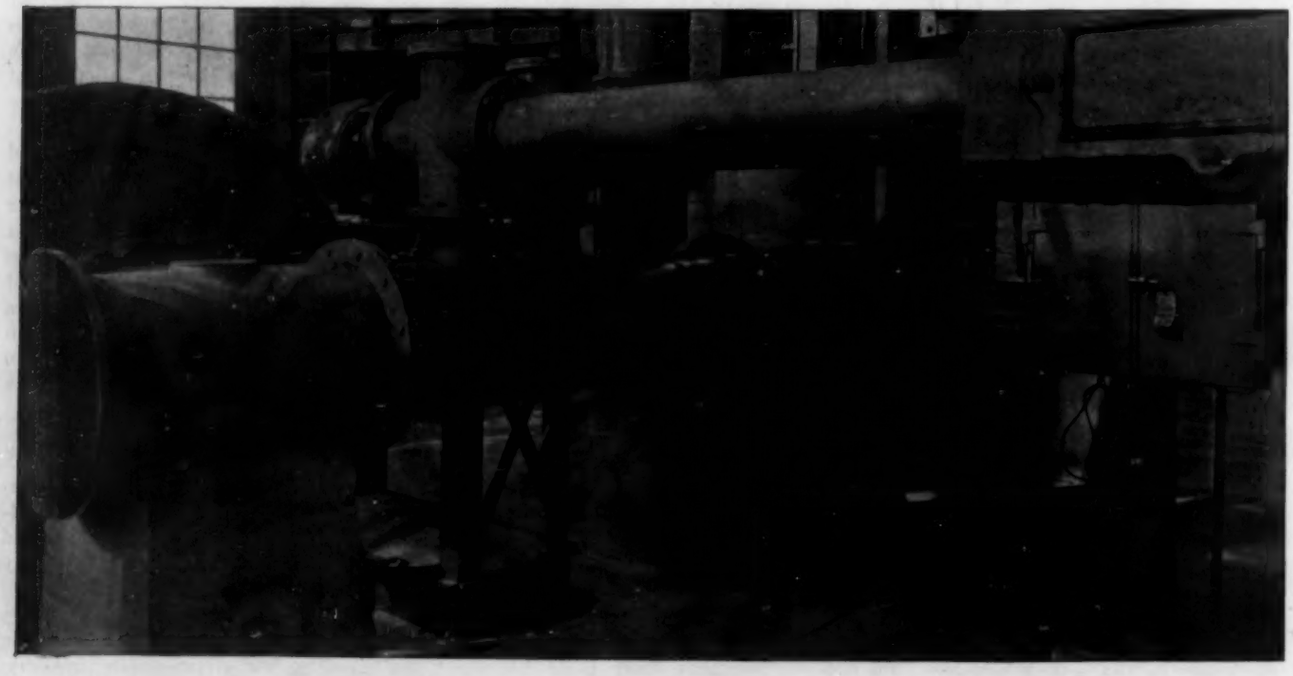
The automobile industry of Italy is one of the marvels of Europe. In 1904 but two firms were producing automobiles; by 1907 the number had increased to 32, with an invested capital of $14,000,000. The industry is practically concentrated at Turin, of which the famous *marques* F. I. A. T. works alone supplied the Italian army with 80 motor trucks a day. Besides, heavy duty oil motors were built for the Italian navy in the San Giorgio works in which the F. I. A. T. society is interested, as also is the Ansaldo firm. Monsieur Agnelli of the F. I. A. T. society is proud of his model factories, which he assures the world are ready to turn out 300 completed automobiles a day, by far the largest output of any automobile factory of Europe. Italy as an automobile-producing country is nearly sufficient to its own needs, besides having a notable export trade to its credit.

It is estimated that Italy has hydraulic force equal to 6,500,000 horsepower available in the rivers and mountain torrents of the Alps, of which the greater part has been harnessed. Northern Italy is justly proud of its vast network of high-tension electric transmission cables which serve to keep the wheels of Italian industry turning. The state railways have equipped many central stations for the production and distribution of this power, and the electric lines in northern Italy are the wonder of electrical engineers of the world. Electric development in the last few years throughout the peninsula has absorbed over $200,000 in capital.

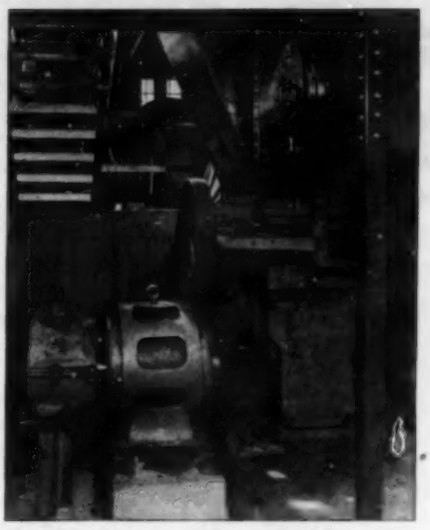
After having swept back the horde of German capitalists who were invading Italy previous to the war, 70,000, according to some estimates, all of them insinuating themselves not as workmen merely but as directors and co-directors of all manner of industry from banking to hotel keeping, the Italians went about setting their banking house in order and for the first time found that if they could not stand alone they could at least find friendly aid elsewhere. At the close of 1917 the receipt of the Italian treasure went up millions of dollars over the figures of 1915 and the prospects for future industrial expansion are bright.

Installs Powdered-Coal Equipment

IN many factories the greatest economies are to be affected in the more efficient utilization of fuels. A method developed in recent years, which is said to effect considerable saving, is the burning of coal after it has been dried and finely pulverized. Many plants have been equipped to take advantage of this improvement among which is the Verona Tool Works, Pittsburgh. This company was established in 1873, and is one of the firms which contributed largely toward making Pittsburgh pre-eminent as the steel cen-



POWDERED COAL FROM STORAGE BIN IS FED INTO SUCTION FAN BY MEANS OF ENCASED SCREW-TYPE CONVEYOR



PULVERIZER WHICH REDUCES THE COAL TO POWDERED FORM

ter of the whole industrial world.

In this plant a large variety of forgings is made, the product including nut locks and track tools of all descriptions, such as are used by the railroads. Quality receives first consideration both in the selection of the raw material and the production of the tool. The equipment for preparing the coal and the Holbeck pneumatic distributing system, was furnished by the Bonnot Co., Canton, O. The Andrews Engineering Co., Pittsburgh, installed the machinery. A ton and a quarter of coal can be prepared and distributed every hour, but provision has been made to increase the capacity to double this amount when occasion demands it. This can be done by simply adding one more pulverizer. The coal being burned at present contains 2.25 per cent moisture, 41.20 per cent volatile matter, 51.80 per cent fixed carbon, 7 per cent ash, and 1.26 per cent sulphur. It will be noticed that the volatile matter is high and the ash low. A coal of this grade burns quickly and gives little slag.

Handling the Fuel

The raw coal is discharged from the car into a reinforced concrete hopper and is fed by means of a reciprocating feeder, into a crusher. An 18-inch belt conveyor carries the small lumps under a magnet and into an elevator, from which it falls into a large storage bunker. From this bunker a spiral screw conveys the coal to an automatic scale, which weighs it and drops it into a dryer. The dried coal then passes to a pulverizer, where it is reduced to a powder. A fan exhausts the powdered product into suitable collectors. In the latter the powdered coal is separated from the air and deposited into a 15-ton storage bin. By varying the density of the air current created by the exhaust fan coal of any degree of fineness can readily be obtained. Three 6-inch spiral-screws conveyors connect the coal-storage bin to the suction side of the distributing fan. Only two of these are driven at the same time, the third acting as a spare.

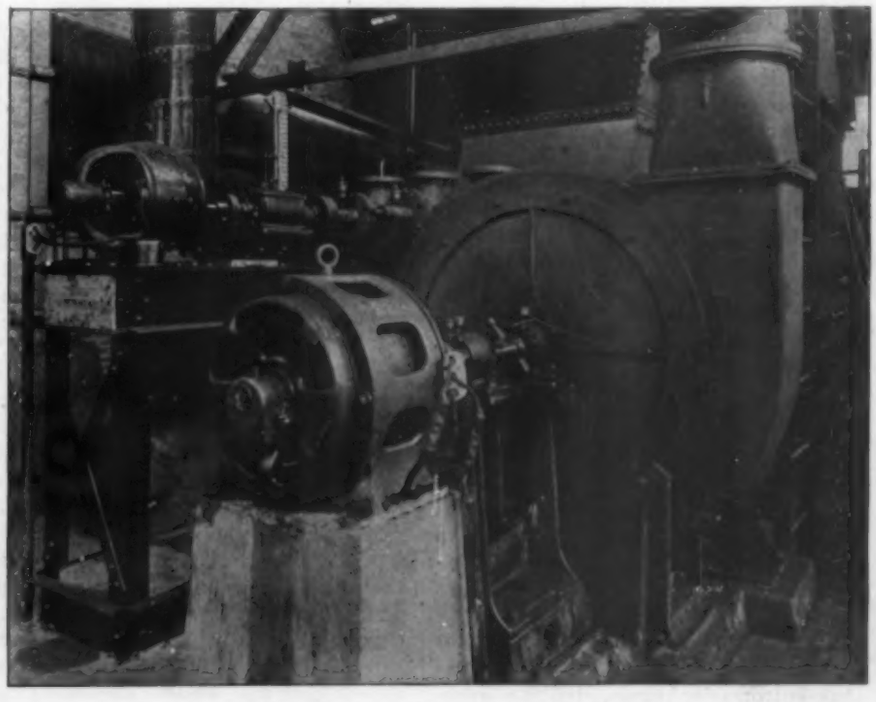
The fine coal is mixed in the fan with a predetermined quantity of air and carried through spiral-lapped pipes to the burners on the furnaces. The proportion of coal to air is maintained automatically, so that when the regulating mechanism has once been set, it needs no further adjustment. The customary ratio carried is one pound of coal to 65 cubic feet of air, but this can be varied to suit the particular heating operation. The main pipe through which the mechanical mixture of air and coal is forced by the fan is located so as to permit the most direct connection to the burners. To control the flow of the fuel, a valve is placed at the juncture of the main and the branch pipes.

Of the 44 furnaces installed at this plant 30 are in the forging department, and 14 are in the nut-lock and tool heat-treating department. The forging furnaces are of two designs the side-door type and the small open-front type used for end and center heating. The former are equipped with stacks and have a combustion chamber and a bridge wall. Two burners are provided for the larger furnaces, while the smaller have only one. The variation in hearth area is from 6 to 50 square feet. Each furnace has an independent source of air supply, which is derived from a small fan directly connected to a motor. These fans will deliver 250 cubic feet of air per minute at a pressure of 2½ ounces.

The size of stock heated in the side-door type of furnace varies from pieces with a cross-sectional area of 1 inch to billets as large as 6 x 6 inches. The fuel originally burned in all the forge furnaces at this plant was either coke or coal, and this was hand-fired. The installation of powdered-coal equipment has eliminated the labor connected with the handling of the coal and coke and the ashes.

In the nut-lock department a spring steel, with a carbon content of 0.90 to 1.10 per cent, conforming to the Pennsylvania spring-steel analysis, is used. This steel is coiled, tempered and drawn, and for these operations it must be heated uniformly and thoroughly up to, but not beyond, a certain temperature. This is being done successfully at this plant using powdered coal as fuel.

Production of cement in Japan is on the increase according to a recent issue of *Commerce Reports*. In 1916 20 Japanese companies were engaged in the manufacture of cement and their output for that year totaled 4,772,579 barrels valued at $9,957,798. This was increased in 1917 to 5,398,918 barrels valued at $15,758,401.



POWDERED-COAL FEEDING MECHANISM AND DISTRIBUTING FAN

When Employer Must Pay Damages

Application of the Law Providing for Compensation for Injuries "Arising Out of and in Course of" Employment Explained—Injury to Employe During His Work Not Necessarily Compensable

BY CHESTER C. SHERLOCK

EMPLOYERS are liable for the payment of compensation only in cases where employes are injured by accident "arising out of and in the course of" the employment. This expression is found in practically all of the acts, and limits the injuries for which the employer is liable to a specific class.

This means that in order for an injury to be compensable, it must be an accidental injury arising out of the employment. It is not necessarily compensable because it arises out of the employer's business, but it must arise out of and in the course of the employe's work.

This universality of expression in the compensation acts has naturally left a great deal for the courts to determine. Not only have they had to go through the whole list of possible accidents and classify each specific event, but they have had to consider with a great deal of care the meaning of the expression "arising out of and in the course of" the employment. Because it outlines the whole boundaries of the employer's liability under the acts, he will be interested in following the reasoning of the leading authorities.

The lord chancellor in an English case, said: "I think an accident befalls a man 'in the course of' his employment if it occurs while he is doing what a man so employed may reasonably do within a time during which he is employed, and at a place where he may reasonably be during that time to do that thing."

Example in Transportation of Workmen

This means that if a man is employed to operate a machine that an accident arising out of the course of his employment would necessarily have to arise out of the operation of the machine, or out of such other duties or actions as are reasonably incident to the operation of such machine. Hence, if the workman is on his way to work and is accidentally injured such accident cannot be said to have arisen out of and in the course of his employment, unless, and this is an exception to note, the employer has customarily transported the workman to and from the place of work. If the employer furnishes the means of transportation he is liable, if he does not then the workman is deemed to be subject to the ordinary "street hazards" which are common to all, and therefore cannot be considered peculiar to his employment.

Ordinarily, a workman must be on the employer's premises in order to be protected by the workmen's compensation acts, but this is not, of course, an iron-clad rule. It depends on the nature of the employment. If the workman is employed entirely at an occupation which takes him wherever the employer may decide to send him, the workman may receive compensation when injured by accidents arising out of work being done under the employer's orders.

An accident may "arise out of" the workman's employment and still not be in "the course of" it. There is a distinction here that should be thoroughly understood. The law specifically demands that in order for an injury to be compensable it not only arise out of the employment but also in the course of the employment. There is not a separation of these two requirements anywhere in the compensation acts. They are, in effect, two tests to be applied to cases as they come up and unless an accident clearly arose out of the employment and in the course of it, then it will be for the courts to say whether compensation is due or not.

In speaking of this matter, one authority says: "An accident 'arises out of' the employment when it is something the risk of which might have been contemplated by a reasonable person when entering the employment as being incidental to it." Lord Justice Farrel, speaking in an English case: "Many accidents occur in the course of, but not out of, the employment; but I am unable to think of any that could arise out of and not also in the course of the employment."

Many cases have pointed out the fact that it is not enough to say that the accident would not have happened if the servant had not been engaged in the work at the time, or had not been in that place. It must appear that the accident resulted from something that he was doing in the course of his work or from some peculiar danger to which the work exposed him.

Another English authority has pointed out the fact that the words "out of and in the course of" must be used conjunctively and not independently. He goes on to say in a certain case: "The words 'out of' point to the origin or cause of the accident; the words 'in the course of' to the time, place, and circumstances under which the accident takes place."

This brief and authoritative statement should enable any employer to readily understand the basic principles underlying his liability under the compensation acts. He is bound only to pay compensation for injuries caused by accident which have arisen out of and in the course of the workman's employment. It is not necessary that the accident arise out of the immediate work which the employe may be doing. If it arises either out of it or out of something incidental to such work, then the injury received will be deemed to be compensable. A workman may, likewise, be at work and receive an injury for which the employer would not be liable.

If you can conceive of a case where a workman is at work at his machine in a factory, when a stray piece of iron, projected by a workman in another building, strikes him and causes serious injury, you would have an instance of a workman being entitled to compensation from his employer. The injury must arise out of injured while at work and still not and in the course of the work in order to be compensable.

As far as known there are but two companies prospecting tin deposits in this country. One is located in Rockbridge county, Virginia, and the other in the Black hills, South Dakota. During the latter part of 1918 the government took over the Virginia mine, which was tied up in a legal tangle and turned it over for development to a Boston company. The South Dakota mine was purchased by a St. Louis company several years ago but the work of clearing out the shaft was suspended due to financial difficulties.

Development of High-Speed Steel

The Introduction of Vanadium Marked the Advent of Modern High-Speed Steel —Steelmaking Rather Than Chemical Analysis Has Governed Improvements in Tool Steel During Past Fifteen Years

BY JOHN A. MATHEWS

HIGH-SPEED steel seems to have sprung fairly fully developed from a variety of sources and at almost the same time, and it is difficult to show just when the change from the old type of air-hardening steels to the modern type of high-speed steels took place. Obviously the change is associated with the announcement of the Taylor-White process; that is, the high heat treatment given these grades of steels as compared with the ordinary treatment of carbon tool steels. This process was announced at the close of the nineteenth century.

The change from air-hardening to high-speed steels was rather a matter of evolution than a distinct invention. Chemically speaking, the change consisted in a very radical lowering of the carbon content and a great increase in the tungsten or molybdenum content. The chromium percentages have not been materially altered as compared with previously existing air-hardening steels; but high manganese, which was an important constituent of the original Mushet steel, is not now an important constituent in high-speed steel; in fact, chromium replaced manganese in most of the air-hardening steels during the later years of their use in the nineties.

In 1901 the writer collected a number of the typical analyses of air or self-hardening steels from large users of these products. In 1902 our analyses showed that the change had already taken place in America, England and Germany, and the contrast is illustrated in Tables I and II. Each table contains products of the three countries mentioned, but the exact maker is not designated.

The high carbon content and the low tungsten or molybdenum content in Table I indicates the character of air-hardening steels in use prior to 1901. In Table II, although these analyses were made only one year later, it is seen that a change in character has come about, and relatively low carbon, with high tungsten or molybdenum, is the characteristic feature of the new steels. It will be noted that two of the steels in Table II, one of molybdenum and the other a tungsten steel, contain no chromium.

Analyses of Steels

Table I

SELF-HARDENING STEELS, 1901

Maker No.	Carbon, per cent	Manganese, per cent	Chromium, per cent	Tungsten, per cent	Molybdenum, per cent
1.....	2.19	1.32	0.50	5.63	....
2.....	1.69	0.45	3.73	7.63	....
3.....	1.14	0.33	2.09	7.98	....
4.....	1.79	0.50	3.96	....	4.54
5.....	1.55	0.24	3.22	7.80	....
6.....	1.55	0.21	3.67	9.42	1.10
7.....	1.78	1.18	....	7.22	....
8.....	1.40	1.65	3.69	....	4.59
9.....	1.75	3.92	....	6.61	....

Table II

HIGH SPEED STEEL, 1902

Maker No.	Carbon, per cent	Manganese, per cent	Chromium, per cent	Tungsten, per cent	Molybdenum, per cent
21.....	0.63	....	4.00	.....	6.00
22.....	0.40	....	4.95	10.75	....
23.....	0.57	0.43	3.30	11.58	....
24.....	0.75	....	....	19.50	....
25.....	0.37	....	5.10	13.83	....
26.....	0.62	....	6.50	21.06	....
27.....	0.84	0.07	2.76	11.25	....
28.....	0.56	....	2.95	9.74	....
29.....	0.60	0.30	....	.....	9.25

Table III

ANALYSES OF STEELS USED IN TESTS

Steel No.	Carbon, per cent	Silicon, per cent	Manganese, per cent	Chromium, per cent	Tungsten, per cent	Vanadium, per cent
31	0.63	0.19	0.26	4.21	13.10	0.25
32	0.61	0.19	0.36	3.34	16.28	0.40
33	0.63	0.27	0.31	2.99	16.87	0.85
34	0.64	0.22	0.24	5.35	18.99	0.15

The greater part of the systematic investigation recently conducted by the author was confined to four steels, the analyses of which are given in Table III. These steels cover quite a range as regards their chromium, tungsten and vanadium content. Steel No. 31 represents a type which was fairly generally used about ten years ago; in fact various writers, as the result of practical tests, have contended that tungsten above 13 or 14 per cent is of no advantage. Practical experience, however, has led for the most part to higher tungsten percentages.

Steel No. 34 is introduced because it corresponds quite nearly with the analysis of steel to which Mr. Taylor referred as giving the best results obtained with any steel at the time he was actively engaged in this work. In fact, because of Mr. Taylor's recommendation, steel of this character was once adopted as the standard material desired by the United States navy. The navy specification, however, calling for high tungsten and high chromium was abandoned after one year because it was found that steel of the type represented by No. 33 gave materially better results. Steel No. 32 is intermediate in quality as compared with Nos. 31 and 33. As the result of a very exhaustive series of cutting tests made as nearly as possible in accordance with the methods outlined and recommended by Mr. Taylor, these four steels will rank about as follows, starting with No. 33 as 100 per cent efficient: Steel No. 34 would by represented by 70 per cent, No. 32 by 66 per cent and No. 31 by 45 per cent.

Starting with hardening temperatures at 1800 degrees Fahr., and carrying them up to 2400 degrees Fahr., it is noted that the electrical resistance, the scleroscope hardness and the coercive force increase fairly uniformly with the hardening temperature up to about 2300 degrees Fahr. There is a slight tendency to show a reversal of these properties beyond this temperature. In other words, it indicates that overheating had commenced. Magnetic induction and residual density, as the hardening temperature increases, are lowered.

If these steels hardened at proper temperatures to develop full austenitic structure are subjected to the tempering operation varying from room temperature up to 1200 degrees Fahr., it is noted that there is a general falling off in the hardness, resistance and coercive force as the drawing temperature is increased. This is not quite in accord with statements that have been made that there is no effect in drawing the temper of high-speed steel until the temperature of 932 degrees Fahr. has been reached. It is true, however, that the effect upon these properties is only slightly influenced below this temperature, while the rate of change increases fairly rapidly at temperatures above 900 degrees Fahr. There is no indi-

From a paper presented at the annual meeting of the American Society for Testing Materials, Atlantic City, June 24 to 27, 1919. The author, John A. Mathews is president. Halcomb Steel Co., Syracuse, New York.

cation, as regards magnetic properties, of anything corresponding to the secondary hardening referred to by Edwards, nor have we found it in connection with hardness tests made by the scleroscope. In cases where the Brinell method is used we find it very difficult to get constant results with materials so extremely hard, but with that method we find an indication of rehardening, or secondary hardening at high drawing temperatures, the maximum usually being at about 1100 degrees Fahr. The lower the temperature at which the initial hardening is done the lower will be the temperature at which the rehardening occurs on tempering, and presumably the sooner a tool so treated will fail in severe cutting where the frictional temperature is high. When the temperature in cutting is not extremely high we cannot conclude that the steel will fail sooner than one with a higher rehardening temperature. In such cases, in my opinion, physical or mineralogical hardness plays an important part as distinguished from red hardness, but where the cutting conditions are severe it appears logical that the higher the temperature of red hardening the longer the endurance of the tools.

The tests were for the most part made upon hot rolled 1 x ⅝-inch bars in just the condition that might have been used for cutting tests or for supplying to users. After all heat treatments, however, the surface was examined by file testing to see that no unreasonable decarbonization had taken place. There was, however, some slight decarbonization of surface in all cases, undoubtedly due to scale and oxidation. However, we wished to operate under conditions as nearly as possible those that would obtain in practical work in case it were found possible to make use of physical tests rather than cutting tests as a means of judging the relative merits of high-speed steels. Of course for determining hardness it is necessary to remove, by grinding, sufficient material to get below any possible decarbonized or oxidized zone.

We are convinced that to make these tests with scientific accuracy requires conditions of heating and temperature control much more refined than are usually found in industrial plants and that it would be desirable to operate on round pieces which could readily be rough turned prior to any treatment and ground on centers after each treatment to insure making the test on perfectly sound material. This, in my judgment, removes such methods from the kind of tests that Mr. Taylor had in mind, as they introduce the same element of expense and require the expenditure of considerable time.

Comparing the analyses displayed in Tables II and III, the most noteworthy change is in the introduction of vanadium, which is now used in practically every high-speed steel; in fact, it is the only general addition that has been made to the earlier types which seems to afford universal improvement in quality. The writer began experimenting with the use of vanadium in 1903. Other experimenters were doubtless working with the same thing, and, in fact Mr. Gledhill referred to its use in 1904, as did also Mr. Taylor. In fact, the composition of tool steel previously referred to as giving Mr. Taylor his best results, showed 0.3 per cent of vanadium. During the year 1905 the Rex AA steel was put upon the market, and other vanadium steels followed shortly, but it was not until three years later that certain foreign makers copied this original steel exactly and made great claims as to originality in regard to their product.

Vanadium seems to have conferred general benefit upon all tungsten-chrome or molybdenum-chrome high-speed steels. In this particular it differs from other additions that have been introduced since. The use of cobalt received considerable attention a few years ago, but it was noted that it was always present as an addition to types of steels that would have given remarkably good results if this material had been omitted. The use of uranium has been advocated during the past few years, but it seems to be very difficult to handle owing to the ease with which it is oxidized, and so far as our experience goes we have been unable to see that it confers any specific benefit. Such steel as we have examined has been more apt to show seams and surface defects than steel in which it is absent, and the microstructure of the steel itself usually indicates the presence of considerable amounts of material that are suspected of being oxides of uranium. It should be noted that when oxide of uranium is formed in melting it has small chance of being eliminated in the slag owing to its great weight. It may be that with more experience means will be found of introducing this material into the bath without such great loss of expensive metal and without the formation of these impurities in the steel which cannot but prove detrimental.

Other elements have been tried, including cerium and zirconium, but no conclusions are available as yet.

The term modern high-speed steel, therefore, may be considered as referring to the product since the introduction of vanadium, as no generally accepted improvement has been made in high-speed steel since that time. Improvements have resulted in the general quality of the material available, due to greater skill in manufacture, and to the availability of superior raw materials in the form of metals and ferroalloys than were obtainable in the early days of the industry. It seems that steelmaking rather than chemical analysis is the first consideration, and so far we are not able to define or to specify all the elements which enter in, from the melting to the finishing of a bar, to produce first-class material in a very wide range of analyses, and no physical or chemical test has as yet been developed which helps very much in determining the matter of quality.

When Stocks Were Low

JOHN A. MATHEWS, author of the accompanying article, began experimenting with the use of vanadium of 1903. *Speaking of the scarcity of the metal at that time, Mr. Mathews says: "It is well to bear in mind that vanadium was almost a chemical curiosity. It was worth about* $15 *a pound, and this was some time prior to the formation of the American Vanadium Co., which later manufactured and sold vanadium in large quantities. So far as I know, the entire stock of ferrovanadium in the country when these experiments were begun consisted of not over* 100 *pounds in the hands of two different dealers in New York. We purchased one-half of the entire stock of each dealer and as a result of the experiments at the old Sanderson works a patent was granted in* 1905."

Investigates Corrosion

In a paper entitled "The Influence of Very Low Percentages of Copper in Retarding the Corrosion of Steel" presented at the twenty-second annual meeting of the American Society for Testing Materials, in Atlantic City, June 24 to 27, 1919, D. M. Buck, metallurgical engineer, American Sheet & Tin Plate Co., Pittsburgh, outlines the results of tests made to determine the effect of small amounts of copper in steel upon the rate of corrosion. In conducting the test two heats of

basic open-hearth steel were copperized in varying amounts from approximately 0.01 per cent up to 0.25 per cent. Sheets from the various ingots were corrugated and with test specimens, were exposed to the weather for varying lengths of time. The sheets were examined periodically to determine the condition of the metal and the loss in weight brought about by corrosion. As a result of the tests the author concludes that very low amounts of copper in steel tend to lower the corrosion rate. It has been customary to consider a copper content of any amount under 0.05 per cent as a trace, and it may be desirable to reinterpret many corrosion data obtained in work in which the effect of these minute amounts of copper has not been taken into account. Copper, to the extent of 0.12 per cent, is said to be sufficient to neutralize the influence of sulphur amounting to 0.055 per cent. Copper amounting to 0.15 per cent is sufficient to protect steels even if the sulphur content is much higher than normal.

Magnetic Tests Show Defective Rails

BY P. H. DUDLEY

SEVERAL cases of induced interior transverse fissures have developed in rail heads under service conditions in the present decade of railroad operations. These have been improperly designated transverse fissures, a term which does not express their location or origin in the interior metal of rail head. The checked nuclei are invisible to the inspectors of the rails at the mills and to the section men and supervisors on the road. Magnetic vision is needed to find them in the rail heads as fabricated.

The division of safety of the interstate commerce commission, from its investigations, classifies them as fatigue fractures of metal due to the wheel loads, and holds that all rails are subject to them. The remedy it proposes is to reduce the wheel loads. This recommendation was made before collecting the service records for rails of different methods of manufacture to see whether or not all were affected alike. The railroad officials, from their records of the service of various rolling of rails, find that those rolled from reheated blooms are nearly free from interior transverse fissures. They find that rails of the same section when rolled direct from the ingots, laid on portion of the same roadbed, and under the same wheel loads, develop a greater number of interior transverse fissures.

Typical Faults in Rails

The paramount question with railroad officials is safety, and hundreds of the failed rail heads have been tested under the drop for brittleness. Tension tests of the metal of the interior of the head also have been made which show a loss of ductility of the metal compared to the enclosing envelope of exterior metal. Delayed transformations have been found by heating and cooling curves; and cores of abnormal metal first on one side of the center of the head have been found on the opposite side of the head in a few inches of length. Well-developed polyhedral crystals have been found as the nuclei of interior transverse fissures which indicate that a germinative temperature existed a sufficient length of time for their development. Moreover, 132 rails were cut in small pieces, and well-developed crystals were found in 22.

SECTION OF A 100-POUND RAIL WHICH SHOWS AN INTERIOR TRANSVERSE FRACTURE OF THE INTERGRANULAR TYPE

The accompanying illustration shows the more predominant type of induced interior transverse fissures and is classified under the name of *Intergranular*. To make the magnetic surveys of rails, the required sensitiveness of the galvanometer must be ample to record a checked nucleus in a new rail from the straightening press. The new rail would only have the checked nuclei and the combined effect of the gag, without any development of the specular surfaces; therefore the sensitiveness must be sufficient to detect these in the leakage curves before they are put in the track.

We have approximated the required sensitiveness of the galvanometer from the magnetic surveys of the other portions of rails which have failed. Where marked oscillations have occurred, we have broken the rails under the drop and found checked nuclei from which incuced interior transverse fissures had just started to develop This work is being repeated on failed rails, and the records are accumulating for comparison and study.

The investigations which can be conducted on rail steel are large, and the work submitted in connection with this report is for the purpose of conveying an idea of the results thus far obtained. There are many features which are not touched upon in this brief report, but the investigations will be continued and broadened as the work progresses.

Magnetic surveys and analyses furnish a fund of information which cannot be secured by any other method of testing. The fact that the materials can be tested without destruction is of prime importance. It is this feature of magnetic analysis which makes it possible to find in advance those rails which after injury under the straightening press would develop in service into a complete interior transverse fissure.

Leads to Restoration

It would seem from what has been accomplished already that the railroad companies are warranted in using similar apparatus to make magnetic surveys of their sections of rails which are rolled direct. Such surveys for the present can best be made by the railroads. Ample room and time are required to determine the brittleness or ductility of the metal in the interior of the heads of a number of rails of one section. A certain amount of ductility is necessary to meet the requirements of traffic under the climatic conditions of the location of the line.

Railroad service requires so many grades of steel with a wide range of physical properties in axles, crank pins, connecting, parallel and piston rods, rails, tires and wheels, that there are several opportunities to develop magnetic apparatus for testing them

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From a paper presented at the annual meeting of the American Society for Testing Materials, Atlantic City, June 24-27, 1919. The author, P. H. Dudley, is consulting engineer, New York.

without destruction. It will also be possible at the same time to study the fatigue of metals and the restoration of their normal physical properties. The subject of restoration is most important. In one case several hundred axles which had been used for five years were immersed in an oil bath and raised to 600 degrees Fahr. for from six to eight hours, and they have since rendered five years additional service without a failure.

The McLain-Carter Furnace Co., Goldsmith building, Milwaukee, has closed a contract with Hijos de Valentin Elcoro, Mexico City, Mexico, for a 5-ton oil burning open-hearth furnace of the McLain-Carter type. A 10-ton basic furnace for heating 4 x 4-inch billets also is being installed by the McLain-Carter Co. at the plant of the Fort Dodge Culvert & Iron Mills Co., Fort Dodge,

The Application of Magnetic Analysis

BY CHARLES W. BURROWS AND FRANK P. FAHY

IT has been generally known for some time that a close relationship exists between the mechanical and magnetic characteristics of steel. The authors of this paper have endeavored to investigate the application of magnetic analysis with a view of determining its value as a practical criterion of the qualities of steels.

After considerable experimentation, the rail permeameter, shown in Fig. 1, was developed. The magnetic circuit consists of about 7 feet of the rail under test, a corresponding length of yoke of heavy H-beam parallel to the test piece, and two heavy H-beam pole pieces about 14 inches long connecting the rail and the yoke. The overhanging portion of the rail and yoke do not introduce any errors into the measurements. In fact these projections are an advantage since they decrease the reluctance of the magnetic path. The magnetomotive force is applied by means of four coils connected in parallel and arranged as shown.

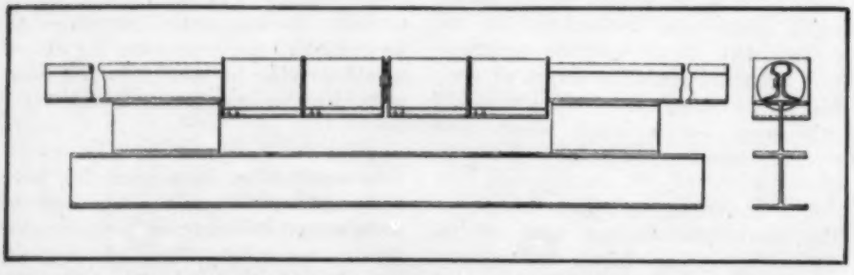


FIG. 1—DIAGRAM OF THE MAGNETIC CIRCUIT OF A RAIL PERMEAMETER GIVING THE POSITIONS OF THE MAGNETIZING AND TEST COILS

The measurement of magnetizing force is made by means of a test coil placed near the rail. By one of the fundamental principles of magnetic induction the magnetizing force parallel to the surface of the rail has the same value within the metal and in the air just outside the metal. If therefore a test coil is placed near the surface of the rail with its axis parallel to the length of the rail we have a means of measuring the magnetizing force acting upon the test specimen.

In cutlery magnetic analysis may be used in the testing of knife blades. The proper hardness of the finished knife blade may be determined in terms of its coercive force. This criterion sorts out the defective material from the good and indicates whether the blade is too soft or too brittle. It will classify good blades in their order of merit. Thus we have a means of telling definitely whether or not a blade is of the highest grade. Furthermore this test does not injure or mar in the slightest the highly polished finished blade. The advantages of such a test are at once evident as the material tested is not injured in the slightest degree.

A magnetic examination of a blade as it comes from the quenching bath tells whether or not the blade is cracked or has been so badly strained in quenching that cracks are liable to develop under further thermal or mechanical handling. Such a test enables a manufacturer to throw out the wasters before they have been subjected to more or less expensive mechanical work. Occasionally a blade or series of blades are underquenched. The same test that detects overquenching detects underquenching. The underquenched material can be at once retreated without loss of further time or labor.

If it is desirable to detect material that has been burned either by grinding or finishing it may be done by a suitable examination before and after the mechanical operations. Possibly a single magnetic test would suffice if sufficient care is taken in the heat treatment.

The problem of magnetic analysis of knife blades that remains to be worked out is the determination of which one of several magnetic criteria will give the best results from a commercial standpoint.

A number of drills were examined magnetically by placing them against the test coil yoke of a Fahy permeameter. The most noticeable fact brought out by the tests is that the order of increasing coercive force is identical with the order of increasing file hardness. The mean value of the coercive force for eight specimens as received, and which presumably are correctly hardened, is 17. The difference between this value and 10, the value of coercive force for the annealed specimen, is so great that there would be no trouble in separating properly treated drills from those which had accidentlly received no heat treatment. Those which have been quenched but not drawn and which therefore are excessively brittle are

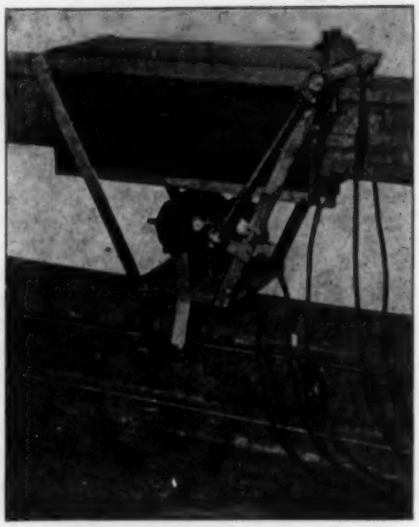


FIG. 2—RAIL PERMEAMETER WITH TRAVELING CARRIAGE USED TO TEST THE ENTIRE LENGTH OF THE RAIL

From a paper presented at the annual meeting of the American Society for Testing Materials, Atlantic City, June 24 to 27, 1919. The authors, Charles W. Burrows and Frank P. Fahy, are with the United States bureau of standards.

distinguished with equal facility from the properly treated drills. Thus the coercive force not only separates the good from the bad drills but also arranges the good drills in their order of merit.

It is shown that there is a close relationship between the magnetic and other physical characteristics of steel, but only by magnetic examination is it possible to determine by non-destructive test whether or not two pieces of steel are identical in properties. For this reason the magnetic test is especially useful in testing the homogenity of rails throughout their entire length. Fig. 2 illustrates one of the latest forms of rail permeameter on a traveling carriage. This consists of a single solenoid moving along the rail under investigation. The return magnetic path is through the massive steel beam underneath the rail.

Deep Etching Reveals Faults in Rails

BY K. E. HOFAMANN AND F. M. WARING

IN some of the many investigations that have been made upon rails which failed due to transverse fissures, etchings of transverse specimens have shown the existence of small cracks located principally near the center of the head, but none of the reports containing reference to such cracks attempted any explanation of their presence, or carried the investigation far enough to show that similar cracks could be found on etchings of longitudinal sections through the head of the rail. It was in attempting to investigate the nature of these small cracks appearing in transverse sections of the rails that the authors were led to extend their investigation to include longitudinal sections about ½ inch thick and 18 inches long taken from the center of the rail head. Light etchings of such sections did not develop any defects and the etching process was then continued for two hours with concentrated acid made up of nine parts hydrochloric acid, three parts sulphuric acid and one part water.

Fig. 1 shows the appearance, after deep etching, of a slab from a rail which had developed 12 transverse fissures when broken upon the drop test. The action of the acid has opened up both transverse and longitudinal fissures whose existence could not be detected under the light etching to which this slab had previously been subjected. This specimen was from an old rail which had been in the track for about five years, and the entire heat, consisting of 61 rails, had been removed on account of a number of failures from transverse fissures. Similar treatment of slabs from other rails in the same heat, which had shown transverse fissures, also gave the same indications to a greater or less degree, there being apparently some improvement in the appearance of the steel. A smaller number of defects opened up under the action of the acid for those rails which showed only a few transverse fissures when broken under the drop test.

Fig. 2 shows the appearance of a deep etched slab from one of the rails which did not contain any transverse fissures. This section is entirely free from any of the cavities which were opened up in the specimen mentioned above.

The existence of these defects in rails which had developed transverse fissures and the failure to find them in rails from the same heat of steel which had been subjected to the same traffic conditions suggested that the investigation should be extended to include new rails. Fig. 3 shows the deep etching of a slab from a new 125-pound rail, and Fig. 4 from a new 130-pound rail, which had never been in the track. Both of these new rails contain a number of defects similar to those found in the old rails.

This investigation by means of deep etching with hot acid has developed the existence of interior defects in rail heads, which defects appear to be more frequent in rails that have developed a number of transverse fissures than in others which had only a few or no such fissures. They have also been found to exist in new rails

From a paper presented by F. M. Waring and K. E. Hofmann at the annual meeting of the American Society for Testing Materials, Atlantic City, June 24-27, 1919.

FIG. 3—SPECIMEN FROM NEW 125-POUND RAIL, ETCHED THE SAME AS FIG. 1

FIG. 4—SPECIMEN FROM NEW 130-POUND RAIL, ETCHED THE SAME AS FIG. 1

FIG. 1—DEEP-ETCHED SPECIMEN FROM OLD RAIL THAT SHOWED 12 TRANSVERSE FISSURES

FIG. 2—DEEP-ETCHED SPECIMEN FROM OLD RAIL THAT HAD NO TRANSVERSE FISSURES

which have not been on the track. Similar interior defects have been developed in a new tire and in a new rolled-steel wheel. It appears that these concealed defects cannot be detected by the usual mthods of investigation and tests, or even by the usual method of etching. The authors are inclined to believe that the cause must be sought in the mill during some stage in the process of fabrication of the material.

Propose Revised Standards

Suggest Changes in Specifications for Girder and High Tee Rails and Plates for Forge Welding

IMPORTANT suggestions regarding specifications and standards were made in the annual report of the committee on steel to the American Society for Testing Materials at Atlantic City, June 24 to 27, 1919. One of the most important matters before the committee is withdrawing of the note from a number of steel specifications which raises the rejection limits for sulphur in all steels and for phosphorus in acid steels 0.01 per cent above the values given in these specifications.

A representative committee of producers and consumers has been appointed to collect data bearing upon the following question: "Considering existing conditions with respect to raw materials, what date shall be set for the removal of the note from the several specifications to which it has applied?"

The committee asks that the five tentative specifications for steel tie plates, boiler and firebox steel for stationary service, carbon tool steel, low carbon steel track bolts, and electric cast steel anchor chain, be continued as tentative for another year without revision.

Eliminate Drop Test

It is proposed to revise the specifications for girder rails, substituting a ball impression test for the drop test now included in the standard specifications for open-hearth steel girder and high tee rails. The committee recommends that the following requirements be published as tentative with a view of adoption as standards in 1921:

"Omit section 7 to 10, inclusive, of the present specifications specifying drop test requirements, and substitute the following: Sections 7 to 9, remembering the remaining sections of the specifications:

"7. (a) Four representative sections of rail from each melt shall be selected by the inspector as test specimens.

"(b) Excess scale on the head of the section shall be carefully removed.

"(a) The head of each specimen shall be subjected to a pressure of 50 net tons for a period of 15 seconds, applied through a ball ¾ inch in diameter.

"(b) The average depth of impression obtained on the four specimens shall not be more than 3.8 millimeters for class A rails, nor more than 3.6 millimeters for class B rails.

"9. If the average of the impression tests from any melt fails to conform to the requirements specified in Section 8 (b), the manufacturer may, at his option, test each rail from such melt by making an impression test on the web, as described in section 8 (a). Rails so tested which conform to the requirements as to depth of impression specified in section 8 (b) shall be accepted."

Consider Annealing Lugs

The committee on steel castings is considering a revision of specifications by which annealing lugs shall be placed on all important castings to aid the purchaser in judging the quality of annealng. Tests which have been carried out on steel castings up to a maximum controlling thickness of 6 inches indicate that the appearance of the fracture of such test lugs when broken fully checks a careful microscopic survey of the structure of the castings. It appears, however, that the fracture of the test lug becomes less indicative of the interior conditions of the castings as the controlling thickness of the casting increases. The committee is not yet prepared to propose this revision and intends to give the matter further consideration during the year.

The committee is considering the advisability of changing the specifications for forge welding plates suitable for tank cars. There apparently was some objection on the part of the fabricators to using steel of the high tensile strength called for in the old specifications, inasmuch as the excessive amount of carbon was said to be a hardship on good welding. It is generally agreed that carbon becomes a deterrent to good welding when in excess of 0.18 per cent. The consensus of opinion is that copper should be left out of the specifications. Limits for silicon, nickel and chromium have been set at 0.05 per cent for each element.

A. W. Gibbs, chairman of the tank car committee of the Master Carbuilders' association, states that the question of tensile strength is subordinate to that of the welding qualities, for if the chemistry required involves low tensile strength, the specified bursting strength can be obtained by increasing the thickness of the plate. The opinion seems to be unanimous that a soft steel is necessary, the general aim being for a carbon content of from 0.08 to 0.12 per cent for satisfactory welding properties.

In the tentative specifications for plates for forge welding the chemical properties are as follows:

Carbon	not over 0.18 per cent
Manganese	0.30–0.60 per cent
Phosphorus	not over 0.04 per cent
Sulphur	not over 0.05 per cent

Other requirements are:

The composition of steel for forge-welding plates should preferably be free from silicon, nickel or chromium. Where these elements are present the maximum quantity of any one shall not exceed 0.05 per cent.

An analysis of each melt of steel shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus and sulphur. This analysis shall be made from a test ingot taken during the pouring of the melt. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements specified above.

An analysis may be made by the purchaser from a broken tension test specimen representing each melt. The chemical composition thus determined shall conform to the requirements already specified.

The material shall conform to the following minimum requirements as to tensile properties: Tensile strength, for plates ¾ in. or under in thickness, 48,000 pounds per square inch; for plates over ¾ in. in thickness, 45,000 pounds per square inch; yield point, 0.5 tensile strength; elongation in 8 inches, per cent 1,500,000 tensile strength.

The yield point shall be determined by the drop of the beam of the testing machine. The test specimen shall bend cold through 180 degrees flat on itself without cracking on the outside of the bent portion, the specification going to considerable detail regarding the preparation of test specimens, the number of tests, permissable variations in weight and thickness, the finished marking and inspection of material.

Report on Ladle-Test Ingots

The report of the subcommittee on ladle-test ingot investigation included a brief paper by J. R. Cain and H. S. Rawdon, chemist and associate physicist, respectively, of the United States bureau of standards. In the experiments conducted by the authors, two sets of ingots from two different heats of low carbon steel, were made by the Carnegie Steel Co., and two sets from two different heats of medium carbon steel, were made by the Cambria Steel Co. One heat each of the low carbon and the medium carbon steel was a rising steel, and received aluminum treatment

(*Concluded on page* 1693)

British Wages Up 68 to 156 Per Cent

Metal Trades Among Those in Which Greatest Increases Occurred During War —Number of Hours Were Reduced From 53 and 54 to 47, Without Affecting Weekly Pay Rate—Cost of Living Coming Down

BY JOSEPH HORTON

British Correspondent of The Iron Trade Review

A RECENT issue of the British *Labour Gazette* throws considerable light on the effect of war on British wages, and also on the progress made in reconstruction. In the iron and steel trades, including smelting, puddling, rolling, forging, etc., most of which have sliding-scale arrangements, the increase has been substantial. Blast furnacemen in Durham and Cleveland had increases in wages equivalent to nearly 68 per cent on their prewar rates and, in addition, war wage advances or bonuses ranging from 2s 3d (54c) to 2s 10d (68c) per shift. In Scotland they received increases equivalent to 51 per cent on their prewar wages and a bonus of 3s 9d (90c) per shift. The rates paid for Sunday work also increased 50 per cent above the ordinary rates.

Iron and steel millmen in the principal districts mostly have had increases of 113 to 117½ per cent on prewar rates and iron puddlers in the same district have had increases of corresponding amounts. Steel smelters, pitmen, etc., generally have received advances ranging from 60 per cent to 77 per cent. In the case of the lower paid men the increase has varied according to the prewar rate, being over 150 per cent for laborers rated at 22s 6d ($5.40) per week before the war.

In the engineering and shipbuilding trades, as the result of excessive awards made by the committee on production, there was a general minimum war wage advance of 28s 6d ($6.84) per week over prewar rates for men employed at time rates, and 10 per cent on prewar rates, plus 21s 6d ($5.16) per week, for men employed at piece rates.

In some districts where the men are employed at hourly rates the total war advance for time workers was 29s 4½d ($7.05) per week. In addition a bonus of 12½ per cent on earnings for time-workers and 7½ per cent for piece-workers was granted to men 21 years of age and over, engaged on munitions work, and was generally extended to men on private work.

In certain cases further advances were given for special reasons to particular classes of men. Angle iron smiths, platers and riveters, caulkers, drillers, hole-cutters, blacksmiths, etc., engaged on admiralty shipbuilding and repair work and merchant shipbuilding, were given special advances during 1917 and 1918, generally amounting to 10 per cent over prewar list prices for angle ironsmiths, platers and blacksmiths, 20 per cent for caulkers, drillers and hole-cutters, and 35 per cent for riveters.

Many Trades Are Represented

The following table shows the average amount of increase, inclusive of the 12½ per cent bonus granted from Aug. 4, 1914, up to the end of April, 1919, on district time rates for men in certain representative occupations:

	Amount of increase per week	Percentage increase on pre-war rates, per week
Engineering:		
Fitters and turners	$9.10	98
Iron molders	9.16	92
Laborers	8.50	156
Shipbuilding:		
Platers	8.96	93
Riveters	8.88	98
Shipwrights	9.02	91
Laborers	7.48	154

In addition to the increase of wages, the workers have been granted reductions of hours from 53 and 54 to 47, without any reduction in weekly time rates.

A large amount of transitional unemployment still exists consequent upon the cessation of war conditions. The total number of unemployed in all trades May 2, 1919, was 1,093,400, as compared with 1,060,245 on March 28, an increase of 33,155. On May 2 63,930 unemployed were in receipt of the reduced donation paid to civilians after the expiration of the first period of 13 weeks' unemployment. Of this number nearly two-thirds were women.

In the pig iron industry employment continues good, the number of furnaces in blast at the works covered by the returns being 269, as compared with 267 in March, and 297 a year ago.

During April 10 furnaces were relighted and eight either damped down or blown out, six in Cumberland and one each in the Midlands and Monmouthshire. The list of blast furnaces includes the following: Cleveland, 71; Cumberland and Lancashire, 28; Yorkshire, 10; Derby and Nottingham, 31; Leicester, Lincoln and Northampton, 26; Staffordshire and Worcester, 27; South Wales and Monmouth, 11; other districts, four. In the iron and steel works the average number of shifts worked in May was 5.65 as compared with 5.59 in April, and 5.76 a year ago.

A matter which gives general satisfaction is the lowering of food prices. The average increase in prices of food on May 1 was 107 per cent above the prewar level, as compared with 113 per cent at April 1. For all the principal items ordinarily entering into the workers' family budget the average increase in retail prices, including rents, was about 105 per cent on May 1, as compared with 110 per cent a month earlier.

In the tin plate trade about two-thirds of the workers were employed during April in 359 tin plate mills and 78 steel sheet mills. This represented an increase of 22 in the number of mills in operation as compared with March, and of 105 compared with the same month a year ago. The number of mills making steel and galvanized sheets working at the end of April showed an increase of two compared with the previous month, and of 16 compared with a year ago. The exports of tinned and galvanized plate and sheets in April, 1914, amounted to 38,439 tons or 10,509 tons more than in March, 1919.

A 40-page bulletin entitled "War Gas Investigations," giving the results of research work conducted during the war, has been issued by the United States bureau of mines. At first the efforts of the investigators were centered upon the development of a gas mask for the army, but the scope of the work soon was extended to include researches relating to different types of poisonous and irritating gases and smoke, smoke screens, gas shells and gas bombs, flame throwers, trench projectors for firing gas bombs, signal lights and incendiary bombs. The result of this work is set forth in considerable detail.

The Grinding Wheel is Mounted on a Swing-Frame Grinder Which is Counterweighted—In Grinding the Billet, the Wheel is Passed Back and Forth by Hand Until all Imperfections are Removed

Cleans Billets By Grinding

WITH the steady increase in the production of steel billets, the finishing process becomes relatively of increased importance, according to R. M. Johnson in *Grits and Grinds*. This operation consists of first removing the scale and then all the cracks and flaws. Cracks left in the billets make seams in the finished plates, tools or whatever the final product may be and must be completely eliminated to produce a high class material. It is of great importance that billets from which steel rails are to be rolled be free from flaws as these are often the cause of rail failures involving serious accidents and loss of life.

There are two different methods used for this operation, grinding and chipping. Roughly, all carbon steel containing more than 0.60 of carbon and most alloy steels containing tungsten and manganese are ground. Some years ago it was common practice to chip all steels which were soft enough to allow the chisel to penetrate easily.

By chipping the seams can be removed from the soft billets rapidly, but the grinding process is also said to be thorough and reliable. By the use of the grinding wheel the metal is removed from the cracks, and there is no tendency of the wheel to cover the crack with metal, provided a wheel of the proper grain and grade is being used.

This leads to a discussion of the grit and grade of wheel best adapted for this work. Wheels should be chosen upon a basis of material removed per wheel and per unit of time and not on a basis of total tonnage of billets ground or hours-life of the wheels. Total tonnage figures are misleading, for although in the case of some billets only 5 per cent of the total weight is ground off, instances have been found in extreme cases where as high as 50 per cent is removed. On a particularly bad run of billets a wheel may snag only 1000 pounds, whereas on a run 4000 pounds may be the production. In the former case, however, the wheel may be actually removing a greater amount of material than in the latter, and, if so, it is obviously the better wheel regardless of the total pounds of billets ground. The same holds true for comparison on the basis of hours of wheel life.

Some interesting results will be obtained if a comparison of wheels is made, keeping a record of the time consumed during grinding, the pounds of metal ground off, and the earnings of the operator. The material removed will have to be obtained by weighing each billet before and after snagging. This is somewhat inconvenient, but during a comparatively short test the information obtained will be worth the effort expended. In order to make a practical investigation of the cost of each pound of material removed, the three factors mentioned above should be recorded. The total wages, wheel cost, and overhead can be calculated and the cost determined.

Several studies of this kind have revealed considerable valuable information, and the laws governing the use of snagging wheels for billet grinding are as a result more clearly understood. Using medium-hard wheels, the life is considerably reduced compared with that obtained when extremely hard wheels are employed. The material removed per wheel is also reduced, but in a much lower proportion. For instance, one individual test showed a decrease in life of 60 per cent, while the material removed decreased only 30 per cent. This amounts actually to an increase in hourly production of about 80 per cent. Even though during a given period more than twice as many wheels were used, the cost of removing each pound of steel was actually reduced 30 per cent.

Besides a decrease in cost, the soft wheel has several other advantages as follows:

1—The grinders, who are working on a piece rate or bonus system, make a larger week's pay.

2—Due to this increase and also the ease with which the material is ground, labor troubles due to slow cutting wheels are eliminated.

3—The production is greatly increased without the necessity of increasing the plant equipment or number of workmen.

4—Hard wheels, owing to the large amount of heat developed, have a tendency to cause the cracks and seams to become deeper instead of being ground out. This is noticed most frequently when high-speed steel is the product.

The accompanying illustration shows a grinding wheel mounted on a swing-frame grinder for cleaning high-speed steel billets.

Electric Drive for Steel Mills

When a man sees both sides of a question his remarks have an interest and value which is otherwise lacking. "It is not invariably an advantage to change to electric drive in steel mills," says R. B. Gerhart, electrical engineer, Sparrow's Point plant, Bethlehem Steel Co., in an interesting paper read before the March meeting of the Philadelphia section, Association of Iron and Steel Electrical Engineers.

In this paper much consideration is given hydraulic power. Even in electrified mills greater simplicity of mechanism often makes it preferable to have some hydraulic devices. A notable instance is the case of large bloom or slab shears which require special flywheel motor-generator sets for their electric operation. Electric drive in such cases has a distinct advantage over hydraulic drive from the standpoint of power transmission and control. The paper covers this point with convincing instances from actual practice. It is costly to transmit hydraulic power any considerable distance due to piping, loss of power through friction and liability to leaks. Normal distance, however, is no item whatever to electric transmission.

Hydraulic power is fundamentally a reciprocating motion agent, just as electric power is essentially rotary in

application. Mechanical devices must be employed when using hydraulic power for rotary motion or electric power for straight line motion. Such added devices are an expense and a source of inertia. Hydraulic power is less popular in cold than in warm climates on account of the danger of freezing. Electric drive is usually more efficient than hydraulic drive, for in any particular cycle of electric operation only sufficient energy is taken from the source of supply to do the work and overcome friction, while the hydraulic piston has to complete its stroke to finish its operating cycle, irrespective of the amount of work to be done.

In simple straight line motions such as is required in the operation of furnace doors and covers, hydraulic drive is convenient. However, where some complication is introduced, such as the control of many furnace doors in a pulpit, the electric drive has an advantage. Continued improvement in the devices for adapting electric power to all steel mill drives makes the future of hydraulic application uncertain, though Mr. Gerhart believes there will always be a field for hydraulic drive where the application is confined to practical limits.

Designs Gate for Soaking Pit Tap Hole

WITH the object of providing means for drawing slag from soaking pits, a Duluth inventor, Thomas D. Hodge, recently patented the device shown in the accompanying illustration. The upper illustration is a cross-section of the soaking pit, while the lower view is another cross-section on a line at right angles with the upper view.

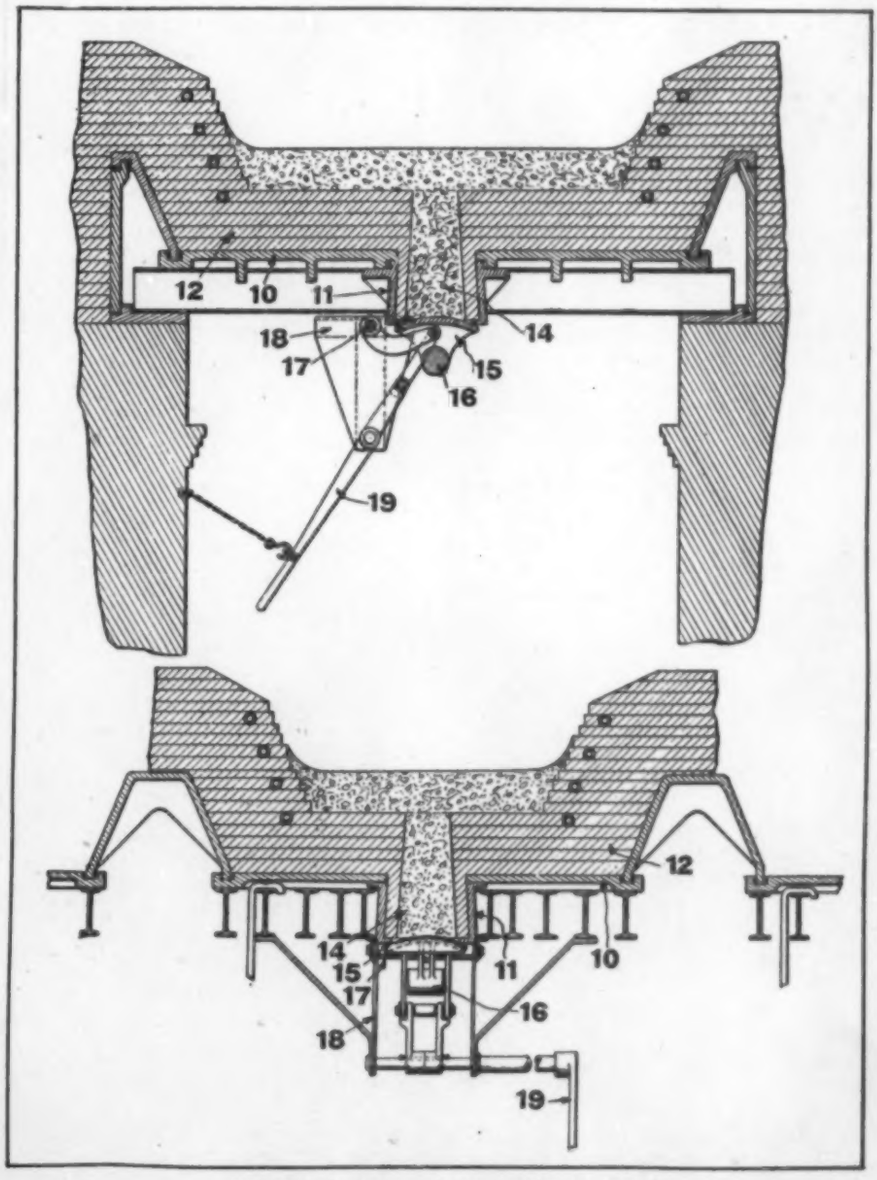
The inventor points that it has been customary to close the tapping holes of soaking pits by means of a slab of refractory material, or a metal plate, which is protected from undue heat by the coke breeze with which the bottom of the soaking pit is lined. He draws attention to the fact that when it is desired to draw off the slag, the slab or plate often has to be broken which sometimes causes the slag to plug up the tap hole.

The inventor overcomes this difficulty by means of a swinging cover, *15*, which closes the tap hole, *14*. By this means, it is said, coke breeze without a refractory or metal plate proves efficient as a closing medium. In the accompanying illustration the soaking pit includes a bottom casting, *10*, to which is fastened a circular casting, *11*, which surrounds the tap hole. The bottom casting, *10*, is lined with built-up refractory material, *12*, which extends downward through the circular casting, *11*. The tap hole and the casting that surrounds it are cone shaped, the greatest diameter being at the bottom.

The passageway, *14*, is filled with coke breeze which medium is also distributed over the refractory material, *12*. Coke breeze in the passage way is prevented from being forced out by the tap hole cover, or gate, *15*. The lower part of this gate terminates in a counterweight, *16*, the object of which is to keep the gate always in an upright position. The gate is pivoted through the medium of a toggle lever to the bracket, *18*, and is operated by means of the hand lever, *19*.

In drawing slag from the pit, the handle, *19*, is moved to uncover the tap hole which causes the slag to flow through the tap hole, carrying the coke breeze with which the tap hole was filled, before it. It is pointed out by the inventor that the slag will not choke the tap hole due to the conical shape.

The Electric Furnace Construction Co., Finance building, Philadelphia, has installed a second Greaves-Etchells electric furnace at the plant of the Ford Motor Co., Detroit. This company also is doing considerable export business at present and recently has received orders from Woodward, Gatty, Saunt & Co., Ltd., Birmingham, England, and G. & J. Weir of Glasgow, Scotland.



SOAKING PIT EQUIPPED WITH SWINGING GATE

Prosperity and High Prices Ahead

Pittsburgh Sales Manager Takes Optimistic View of Future—Sees American Industrial and Commercial Supremacy in Decade—Outlines Financial Situation and Discredits Rumors of Panic

BY H. P. BOPE

THE tremendous calls upon the mechanical world in the last three or four years have created a supply which is beyond the ability of the American people, at least, to absorb. That we shall grow up to it in time is unquestioned, but at present there is a productive capacity which is beyond our ability to take care of. I believe that we are going to be called upon for a large amount of material for manufacturing purposes, which will be largely taken care of by European countries. In doing that they are going to leave neutral markets, for the time, at our disposal. England has suffered greatly but she has been taught in the last few years to speed up. We never considered her much of a figure in the years past because of her labor. That has all been changed and while the trend of prices in England is much better than in our country, it probably will be five years at least before England can return to a basis of prices which will make them active competitors.

At the same time England's position during the war makes it absolutely necessary for her to be a producing country to obtain as large a return in her revenue as it is possible to get. Her production has speeded up 100 per cent. She has learned so much from this world struggle that we must regard England as the most formidable competitor we have.

There is little fear of difficulty in supplying this country, although the needs are great. Before the war we had a productive capacity in this country, although it was never reached, of 55,000,000 tons of ingots. These figures apply not only to the ordinary production, but also to the production from steel industries, from electric furnaces, and from all the various forms from which steel can be cast.

Freight Rates Cannot be Reduced

We are depending upon the railroads for a large majority of our transportation. The railroads have been miserably handled by the United States. There has not been a trunk line or any railroad system in the country that has made any money since the government took charge of it. There has been no rehabilitation. The number of cars needing repairs in the United States today is greater than ever before in the history of the country. Congress is about to appropriate $750,000,000 for the railroads as a loan, where they have asked $1,250,000,000 as a positive necessity. That amount of money is not going to be sufficient to take care of the railroads' needs. The result is that there can be no reduction in rates and no reduction in labor. One of the greatest steel companies in the United States has made the statement through its chairman that it is inadvisable to touch the wages of labor.

Pig iron, as an element of cost in the manufacture of steel, will go higher due to increased costs of labor and transportation. It is difficult to see how the prices of steel can be reduced below the present standard. As a matter of fact, the indications point to a desire to obtain higher prices.

The high cost of living must be considered. The United States government has maintained the price of $2.26 a bushel for wheat. It is difficult to see how the price of bread can be reduced, and other elements are going to be the same in proportion. So we must realize that in the change of world conditions, we have taken a step upward on the plane of cost from which we cannot descend, if ever, for a considerable space of time. Therefore, while the supply of steel will be ample, the trend of prices is to be higher.

Fuel is an Important Factor

Fuel has always determined the value of a particular locality for manufacturing, and in the great coal districts, that are yet to be touched, we have an element of tremendous wealth that is going to add to our prosperity. Because of these large opportunities, the United States will maintain its place as a great manufacturing—financial and commercial nation. There is no reason why the nation should not profit by the prosperity which now is at hand.

We have become a great creditor nation of the world and our recources are still unimpaired to any considerable extent. There have been some pessimistic utterances as to money, and many men feel that the United States is on the verge of a great monetary crisis. We have not spent much of our money outside of the United States. It has been advocated indirectly that we ought to cancel the debts that are owing to us by foreign nations. Possibly that would be a good thing to do. That money was all spent in the United States. The government loaned it to England, France and Italy, but it has gone around in a circle. With its reserve banking system, with the ability of the manufacturer to compete for trade in the markets where he wants to go, the nation can establish credits on a firmer basis that will enable it to take care of the surplus which it has.

Every one is speculating more or less. We have no cause to feel that we are upon the verge of an industrial or a financial panic. With what we have yet to take out of the ground and with our possibilities in the way

Says Steel is Dethroned

IN spite of the pessimistic utterances that have been made the American business man is determined to create a condition of prosperity the like of which this country has never seen before. It is illustrated by the single fact that during May there were 900 incorporations of new enterprises, involving $750,000,000. Since the first of the year incorporations have amounted to more than $2,500,000,000. Does that look as if the American business man has any lack of faith in the future? Certain elements are going to operate. For instance, steel for the time isn't going to be king. Prior to the civil war cotton was king; after the civil war, wheat; then came steel and today it seems that oil, associated with coal is king.—From address of H. P. Bope.

From a paper presented at the annual meeting of the American Drop Forge and Drop Forge Supply associations at Pittsburgh, June 14. The author, H. P. Bope, formerly was sales manager, Carnegie Steel Co., Pittsburgh.

of crops, we still shall be the granary of the world. We can take care of other peoples, not only industrially, but in the matter of food stuffs, commercially and financially.

The world has had much trouble in the last few years; it has endured suffering; it has paid dearly for many of the mistakes that human nature has made, but this great struggle is going to come a greater, broader nationalism.

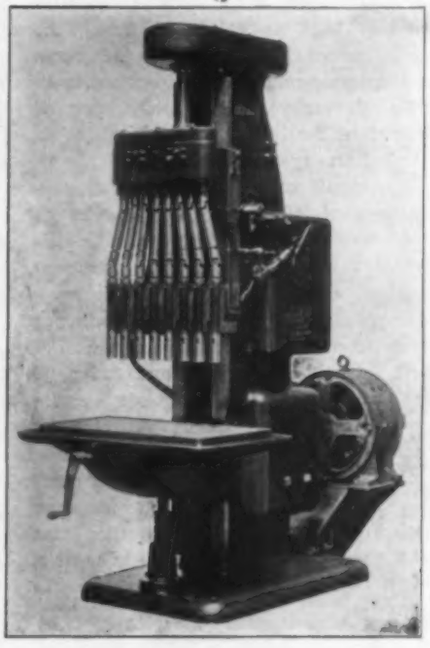
Drill Meets Many Demands

TO MACHINE a number of holes in the time ordinarily required for machining a single hole is the result sought when designing the machine shown in the accompanying illustration. This tool is a product of the Defiance Machine Works, Defiance, O., and is said to meet the extensive requirements of a production machine for multiple drilling, boring or reaming operations.

The base and column are cast in one piece. The front of the column is provided with square ways on which the spindle head and platen slide. The platen is located on the column by gibs of the square-lock type and is raised and lowered by means of a telescopic screw operated by a crank handle at the front.

The spindle head is a box casting, held in place on the column ways by square-lock gibs. This unit carries the spindles and the spindle drive gears. Each spindle when arranged to be adjusted, either universally or in a straight line, is connected to the drive gears by a telescopic drive shaft fitted with universal joints. The spindles are supported by brackets which are located in two T-slots. These are machined in a flange located at the lower end of the spindle head.

The tool is driven by a motor located on a bracket at the rear of the column. The speed mechanism is located in the column near the base. Power is transmitted from the motor by a vertical drive shaft. The feed mechanism is operated from the drive shaft through hardened steel bevel gears and is housed in the column just above the speed mechanism. The feed consists of two friction clutches and a jaw clutch. The friction clutches run in an oil bath while ball bearings are provided to take up the end thrust. By engaging one of the friction clutches, the spindles are rapidly lowered until the drills are in contact with the



MULTIPLE-SPINDLE UPRIGHT DRILLING MACHINE FOR PRECISION WORK

work at which juncture the jaw clutch is automatically engaged to feed the drills into the cut. As soon as the drills have passed through the material, the friction clutch is automatically engaged to return the spindles to the starting point. The levers operating the clutches are interlocking which prevents more than one clutch being engaged at a time.

The feed screw is comparatively large in diameter and has a coarse pitch. It is actuated by the feed mechanism through a vertical drive shaft and a train of spur gears. The screw threads work in a hard bronze nut which is immersed in an oil bath to insure lubrication at all times.

Oiling is by a force-feed, gravity flow and splash system combined. The speed and feed mechanisms, taken collectively, and the spindle head separately, are each provided with independent and self-contained oiling systems which are said to insure positive lubrication at all times.

Propose Revised Standards

(*Concluded from Page* 1688)

in the mold. The other heats were poured into the mold without aluminum addition. The purpose of this work was to compare the five ingot types, and to demonstrate whether or not aluminum treatment in the mold removed any defects found in the corresponding ingots of the companion heat, and particularly whether aluminum treatment would give sound ingots with rising steel, these being difficult to secure in such steel without its use.

The analyses of the heats are as follows:

Type of steel	Carbon, per cent	Manganese, per cent	Phosphorus, per cent	Sulphur, per cent
Low-carbon:				
Aluminum treated..	0.19	0.45	0.010	0.031
No aluminum	0.20	0.46	0.014	0.034
Medium-carbon:				
Aluminum treated..	0.58	0.51	0.033	0.032
No aluminum	0.56	0.99	0.016	0.033

As a result of the experiment the authors conclude that the ingot molds with large openings, and provided with handles are easiest to fill. The effect on chemical homogeneity of aluminum additions to low-carbon steels is slight, but there is marked improvement in soundness. The effect of aluminum additions to the medium-carbon steel was to materially eliminate carbon segregations in all types, as well as to produce physical soundness.

Testing Cleanliness of Producer Gas

BY H. F. SMITH

INTEREST in practical plant methods of determining the efficiency of gas cleaning apparatus has been greatly stimulated by the increasing use of manufactured gas in the iron and steel industries. Many of the tests proposed for checking the purity of the fuel are more suitable for laboratory work than for use in plants or are not accurate enough. The method of testing described in the following paragraphs has proved to be sufficiently simple to be used by the average plant operative and furthermore gives remarkably accurate results.

The necessary equipment consists of a filter paper holder of any convenient size, preferably to take a 3-inch filter, and an ordinary dry test meter reading down to .01 cubic feet, such as is commonly used by city gas companies to register gas consump-

The author, H. F. Smith, is general manager, the Smith Gas Engineering Co., Dayton, O.

tion of the various gas appliances.

Connection is made to the discharge or clean gas side of the apparatus to be tested, and a sample of gas through a clean white filter paper is taken. The filter holder should be placed with the paper horizontal and the flow of gas should be upward. The connection to the point of sampling should be as short and direct as possible. The rate of flow should be controlled by a valve placed on the discharge side of the filter holder between it and the meter. If a valve is used in the connection between the point of sampling and the filter holder it must be wide open during the test. With a 3-inch filter paper, gas can be passed at a rate of about 1 cubic foot per minute. A higher rate will probably tear a hole in the paper and invalidate the test. After 10 cubic feet of gas have passed through, the paper should be removed, marked with the quantity of gas passed, and laid aside for future reference. A second paper, subjected to 20 cubic feet, and a third to 30 cubic feet should be treated in the same way. The meter should then be connected to the inlet or dirty gas side of the apparatus under test, and a series of filter papers taken starting with .01 cubic foot for the first, .02 for the second, and so on. Special care should be taken on this series not to restrict the flow in any way until after the gas has passed the filter. The connection between the points of sampling and the filter holder should be very short and direct, and the space below the filter should be filled with dirty gas before the filter paper is clamped in position so as to be sure that the full quantity of gas as indicated by the meter really passes through the filter. The quantity of gas passed through the second series of papers should be such as to make one of them match in shade a paper of the clean gas series. A little experience will indicate the required volumes.

For example, suppose that the dirty gas paper for .01 cubic foot matches in shade the clean gas paper for 20 cubic feet. This shows that there is as much tar in .01 cubic foot of dirty gas as in 20 cubic feet of clean gas or in 1 cubic foot of dirty gas is in 2000 cubic feet of clean gas. In other words, 1999 parts of tar have been removed out of a total of 2000, giving a cleaning efficiency of 99.95 per cent.

If we assume, as some have done, that a moderate degree of cleanness is sufficient for fuel gas, and take 95 per cent cleaning as a standard, 5 per cent of all tar produced passes into the mains. Producer gas yields from 100 to 200 pounds of tar per ton of coal; therefore, according to the assumption, from 5 to 10 pounds of tar for each ton of coal gasified is retained. On a plant gasifying one ton per hour from 120 to 240 pounds per day or 18 to 36 tons of tar per year is carried into the distribution system. This amount is sufficient to cause considerable plugging of the pipes.

Gas Unusually Clean

Recent improvements made in this country and the development of more effective methods of cleaning make it easily possible to greatly exceed the efficiencies of cleaning mentioned. Recent tests on several installations of large capacity show efficiencies of over 99.9 per cent and frequently ratios as high as 99.98 per cent. This gas is more than 200 times as clean as the gas mentioned in the foregoing example and can be carried without difficulty in any kind of a distribution system.

The significance of fractional percentages of efficiency in cleaning is interesting. At first glance the difference between 99 and 99.98 per cent cleaning seems small and unimportant. With 99 per cent cleaning 1 per cent or .01 of tar is carried forward. With 99.98 per cent only .02 per cent or .0002 of tar passes the cleaner. In other words, gas cleaned at 99.98 per cent efficiency is 50 times as clean as gas cleaned at 99 per cent. This involves as great an increase in cleanness as the whole range from dirty gas up to 98 per cent cleaning, which is also a fiftyfold increase in cleanness.

Want Publicity

Handling Machinery Manufacturers to Popularize Labor-Saving Devices

Determined in their efforts to show the public that much of the heavy work now done by hand can be done by machinery, the delegates to the convention of the Material Handling Machinery Manufacturers' association, held at the Hotel Astor, New York, June 10 and 11, devoted the majority of their attention to the matter of publicity. At the opening session, E. B. Hill, McGraw-Hill Publishing Co., New York, emphasized the value of co-operative publicity. He suggested the development of an association trade mark, urged the association to gain direct publicity by advertising in technical and trade journals, and spoke of the advantages of mass grouping of advertising of all manufacturers making mechanical handling machinery.

J. M. Van Harlingen, the Public Motor Truck Co., Alma, Mich., read a paper entitled "Observations on the Field for Material Handling Equipment." He commented on the work done at the plant of the Fisk Rubber Co. in synchronizing its transportation movement by using industrial trucks, trailers, elevators, etc., and handling all of this under the management of one transportation superintendent for the entire factory, with

As a result of considerable discussion over various means of advertising the work of the association, a motion was made that an advertising council be formed. This council is to study all of the suggestions offered and to formulate a plan of advertising which may be profitably followed by individual manufacturers and by the association as a body. A. J. Barnes, director of publicity, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., was elected temporary chairman to co-operate with W. B. Clarke in working out a program for the advertising council.

Paul Caldwell, Cleveland Crane & Engineering Co., Cleveland, and chairman of the motion picture committee told the association that 12 companies of the association have agreed to cooperate in the development of a general film showing mechanical handling to the public through the bureau of commercial economics and other channels.

James H. Collins, special writer for *The Saturday Evening Post,* delivered a paper entitled "My Contact With Co-Operators in Business."

Senator Theodore Burton spoke on the expansion of port and terminal facilities as the controlling factor in the success of an American merchant marine.

Roy S. MacElwee, bureau of foreign and domestic commerce, department of commerce, Washington, gave an illustrated talk on American and European pier and wharf equipment.

To Add Shape Production

Further important extensions in the Canadian steel industry are foreshadowed in a decision made by the Lake Superior Corp. to begin work immediately on an extension of the rail mill of the Algoma Steel Co.'s plant at Sault Ste. Marie, Ont. The purpose of the extension is to make possible the production of structural steel up to 23 inches. The mill is expected to be completed by next November. It is stated that this is but the first step in a considerable development of the plant, with a view to further caring for the Canadian market for this form of steel product.

Plan to Finance Europe's Rebuilding

Proposed by Bill Under Preparation to Organize Great Corporation in which Government and Private Business Interests Will Join to Provide Credits for Materials and Machinery—Outline Course for Belgium

WASHINGTON, June 24.—Means of supplying Europe's financial and industrial needs are being considered here and abroad by practically the gamut of the interests of the American nation, including those of the United States government. The generally well recognized trade opportunities overseas are said to reach such stupendous proportions that neither American business interests or the government alone would be capable of readily meeting the demand. The situation calls for the highest type of organization to incorporate all interests and the study being made of the question is just beginning to make itself felt.

As a means of crystallizing the plan and having a starting point in determining the scheme as it will be finally worked out, one of the senators from an eastern state has prepared a bill, which is expected to be introduced soon, to organize a mammoth corporation with hundreds of millions of dollars capital. This corporation, to handle America's share of the rebuilding of devastated Europe, will, it is contemplated, include not only the United States government as one of the stockholders, but will take in the United States Steel Corp., the Consolidated Steel Corp., and other exporters, as well as big banking interests such as J. P. Morgan & Co., the National City Bank, Kuhn, Loeb & Co., etc.

How far the plan has actually progressed and what attitude the financial and industrial interests have taken, has not been disclosed, but it is said authoritatively that the government is in favor of some such means of helping Europe. Almost on the heels of the latest report concerning the plan, that of its incorporation in a proposed bill by the eastern senator, and regarded as confirming the government's interest in the plan, was the address last Thursday of President Wilson before the Belgian chamber of deputies, in which he said:

"What her (Belgium's) friends must do is to see to it that Belgium gets the necessary priority with regard to obtaining raw materials, the necessary priority in obtaining the means to restore the machinery by which she can use these raw materials, and the credit by which she can bridge over the years which it will be necessary for her to wait to begin again.

"These are not so much tasks for government as they are tasks for thoughtful business men and financiers, and those who are producers in other countries. It is a question of shipping also but the shipping of the world will be relieved of its burden of troops in a comparatively near future and there will be new bottoms in which to carry the cargoes, and the cargoes ought readily to impel the master of the ship to steer for Belgian ports.

"I believe, after having consulted many times with my very competent advisers in the matter, that an organized method of accomplishing these things can be found. It is a matter of almost daily discussion in Paris, and I believe that as we discuss it from day to day we come nearer and nearer to a workable solution and a probable plan. I hope, not only, but I believe, that such a plan will be found, and you may be sure that America will be pleased."

May Utilize Finance Corporation

With the war finance corporation empowered to aid export trade up to $2,000,000,000, but with the time limited in which to do this, it is expected the proposed measure will give the finance corporation a new lease on life in order that it may be the active agent of the government in the new corporation for as long a period as Europe's demands require. Whether the proposed credits arrangement would assume some of the war functions of the old war industries board, is not known. The President's reference to priorities in his Belgian address is not taken literally here. It is believed he meant that organization of such a corporation as is suggested would naturally center attention in Belgian and other European necessities as compared with ordinary business transactions.

Senator Owen, former chairman of the banking and currency committee, introduced a bill in the senate soon after congress convened, but this plan, somewhat similar to the one now contemplated, has been changed by the proposed measure. It is said that Secretary Glass of the treasury department and officials of the federal reserve board are opposed to having the government take any part in the financing of Europe.

The federal reserve officials have proposed a plan for submission to congress by which national banks would be authorized to invest 5 per cent of their capital and surplus in one or more corporations "principally engaged in such phases of international or foreign financial operations as may be necessary to facilitate the export of goods from the United States." With resources aggregating $2,000,000,000 the national banks would be able to subscribe a capital stock of $100,000,000, it is pointed out. Those who are said to know, however, declare such a sum far too inadequate to meet the requirements.

Government Pushes Sales of War Steel

WASHINGTON, June 24.—Fair progress is being made by the war department in disposing of its surplus supplies of steel. From June 5 to June 18, sales to the value of $2,000,000 were made. Most of the tonnage was shell steel in the form of slugs and forgings, the greater portion of it going to scrap dealers at a price of $19 a ton. Up to June 1, revised reports to the office of the director of sales show that the war department had for sale through that office 5512 tons of raw material, 223,555 tons of semifinished material, 76,057 tons of finished material and 491,590 tons of scrap. Surplus nonferrous material on hand offered for sale includes 80 tons of aluminum, 32,455 tons of brass, 646 tons of bronze, 2565 tons of cupro nickel, 10,695 tons of lead, 15 tons of solder, three tons of pig tin, 38,015 tons of zinc, 3268 tons of miscellaneous nonferrous scrap, 20,000 troy ounces of platinum, 1142 pounds of silver, 1419 troy ounces of silver scrap, 11 tons of Liberty silver, 71 tons of nickel nickel and one ton of nickel silver scrap. All of the

copper offered has been contracted for.

Of cold drawn and rolled bessemer and open hearth screw stock the ordnance department holds 24,000,000 pounds for sale, about 80 per cent of it being bessemer steel. The sizes of rounds range from ¼-inch to 3⅞ inches, representing about 2,500,000 pounds; flats, ranging from ¼-inch x ½-inch to ½-inch by 2 inches, represent 2,000,000 pounds, and hexagons range from 1⅛ inches to 3 inches. It is desired to sell this material as screw stock rather than as scrap. It is the object of the department to segregate the material in the various storehouses and that which it does not sell in the immediate future will be held for better prices. The department already has sold 750 gross tons of screw stock at prices ranging from $40 to $60 a ton. The lowest price on any sale yet made was for 449,997 pounds of 2⅞-inch rounds, disposed of at Boston for $35.90 a gross ton.

The location of the screw stock in the various districts and the pounds held at each place, follows: Bridgeport, Conn., 486,989; Rochester, N. Y., 4,747,053; Boston, 4,412,799; Cincinnati, 1,801,886; Baltimore, 2,590,207; New York, 1,520,961; Toronto, Ont., 4,032,008; Chicago, 1,834,536; Detroit, 1,384,475; Cleveland, 1,214,299; Pittsburgh, 167,000.

All of the materials held by the war department have accumulated at the manufacturing plants, depots, camps, posts and arsenals operated by the various bureaus of the department. The materials are offered for sale from time to time, the general method being by sealed bids.

Each bureau is responsible for the sale of the surplus raw material and scrap to which it holds title under the supervision of the director of sales, and the majority of them maintain sales offices in the principal city located in each of the zones and districts into which the country has been divided by the war department, through which disposition is made of all material accumulating in that particular territory.

The revised report of surplus material, as of June 1, as made to the office of director of sales, gives the following tonnages:

RAW MATERIAL

Iron ore, 733; pig iron, 3,956; ferrosilicon, 276; ferromanganese, 412; spiegel pig, 105; total, 5,512.

SEMI-FINISHED

Ingots, 20,931; billets, 147,166; billet forging, 132; shell steel bars, 5,673; cast steel slugs, 49,653; total, 223,555.

FINISHED MATERIAL

Bars, hot rolled, 22,864; bars, cold rolled, 22,033; iron bars, 238; strip steel, 1,765; structural steel, 2,580; angle iron, 261; reinforcing steel, 162; plates and sheets, 8,270; tin plate, 2,090; galvanized iron (sheets), 90; black iron (sheets), 389; pipes and tubes, boiler, 697; steel tubing, seamless, 1,337; iron pipe (soil), 1; armor plate, 1,573; manganese steel, 247; nickel steel, 2,465; chrome nickel steel, 28; vanadium steel, 428; high-speed tool steel, 164; tool steel, carbon, 1,221; rails, steel, 67; wire, 1,036; welding rod, 61; total, 76,057.

SCRAP

Shell forgings, G. T., 331,507; heavy melting scrap, 12,976; heavy melting nickel steel, 8,121; steel forgings, miscellaneous, 51,964; steel castings, 11,021; miscellaneous scrap, 61,769; cast iron, 2,133; malleable iron scrap, 15,413; borings and turnings, 948; borings and turnings nickel steel, 2,912; high-speed scrap, 156; sheet steel scrap, 112; low phosphorus steel, 2,558; total, 491,590.

NONFERROUS METALS INCLUDING SCRAP

Aluminum

Raw, 15; sheet, 2; casting, 38; knobs, 15; tire wire, 8; tubing, 1; scrap, 1; total, 80.

Brass

Rod, 4,382; cast bar, 69; strip, 4,454; discs, 1,444; cartridge, 11,833; billets, 881; clips, 135; forgings, 290; sheet, 3,843; base covers, 61; primers, 195; spring, 13; tubing, 22; wire, 553; fuse, 8; diaphragm, 20; casting, 1; components, 230; ash and sweepings, 47; miscellaneous, 1,696; scrap, 2,190; babbitt metal, 100; babbitt scrap, 7; total, 32,455.

Bronze

Rod, 91; ingot, 60; manganese, 1; naval, 1; phosphor, 21; components, 464; tobin, 7; scrap, 1; total, 646.

Copper

Entire surplus contracted for.
Cupro nickel, 2,565.

Lead

Discs, 590; caulking wire, 613; wire, 93; pigs, 3,693; pipe, 28; sheet, 38; antimonial lead pigs, 472; heavy sheet, 5,000; bullets, 150; scrap, 11; total, 10,695.

Liberty silver, 11; nickel, 71; nickel silver-scrap, 1; platinum, troy ounces, 20,000; silver, pounds, 1,142; silver-scrap, troy ounces, 1,419.

Solder (no. Anal.), 7; solder, 40 per cent SN 60 per cent PB, 4; solder 50 per cent SN 50 per cent PB, 4; total, 15.

Tin

Pigs, 3.

Zinc

Raw, 38,000; sheet, 13; sheet scrap, 2; miscellaneous nonferrous scrap, 3,268.

General Tariff Hearings to Start Loan

WASHINGTON, June 24.—With the completion last week of hearings before the house committee on ways and means regarding a protective tariff on magnesite, potash, zinc ore, and dyestuffs, Chairman Fordney has announced that general tariff hearings will be started soon after July 4. It is proposed that the hearings shall bear upon all industries of the country, and statistics and data now are being assembled preliminary to making an exhaustive study of the tariff situation with a view to drafting a measure to revise the tariff in accordance with campaign promises of the Republican majority in congress. Actual passage of such a bill, however, under the present administration is not considered to be at all likely, but Republicans, hoping to come into full power, both in the executive and legislative branches of the government, at the next Presidential election, contend that by framing a bill at this session they will be in a position to enact it after they acquire control of the government.

Hearings on the bill of Representative Hadley of Washington establishing tariff duties on magnesite, to encourage the production in this country which was so greatly stimulated under war conditions were heated and unusually interesting. It developed that not only was there a sharp division of sentiment between domestic producers of magnesite and makers of magnesite brick, but that sentiment even between Republican members of the committee is divided. Democratic members indicated that they, too, hold differing views.

Representatives of magnesite brick makers, who opposed the Hadley bill, but some of whom claimed they would not object to a reasonable tariff on magnesite if the committee found it to be justified, contended that the Austrian commodity made brick which is superior to that produced from domestic ore. Representatives of the American Refractories Co., Pittsburgh, submitted letters from prominent iron and steel makers who said they hoped shipments of Austrian magnesite soon would be resumed because they considered brick made from the foreign product was much more durable and satisfactory than that made from American magnesite.

At the same time other letters from prominent iron and steel manufacturers were read by H. F. Weirum, general manager of the American Minerals Production Co., Valley, Wash., and statements were made by representatives of the Northwest Magnesite Co., which upheld the quality of American magnesite brick.

Included in the hearings to be held is one relating to the bill of Representative Timberlake of Colorado, fixing a duty of $10 per unit on tungsten.

Co-operative Management Is Gaining

Questionnaire Circulated by Western Efficiency Society Discloses Interesting Results—Variety of Plans and Methods are in Operation In Various Plants --Better Teamwork and Stimulation of Production Brought About

CONFESSING themselves in the dark and setting out on a voyage over seas which have not been charted but confident that by sincere effort they will find a path leading to harmony and improved relations between worker and employer members of the Western Efficiency society met in annual national convention at the Hotel Sherman, Chicago, last week. The purpose of the convention was stated as "an unbiased examination of all the facts obtainable in the important matter of the relationship of employer and employe."

Perhaps the most important session was that devoted to consideration of "The New Relationship in Practice," which gave opportunity for summing up much of the matter covered in previous sessions. A report prepared by Frank E. Gooding, department editor of *Factory*, was read by George C. Dent, vice president of the society in the absence of Mr. Gooding. This report was a summary of replies to 1000 questionnaires sent out to manufacturers in all lines. While definite tabulations could not be made in all instances there were sufficient data to give a good indication of the trend and progress of the movement.

The questionnaire first asked each manufacturer to detail his experience with co-operative management. One concern, a plate glass manufacturer, was started in a small way as a co-operative company, the workmen being its owners. As the business increased and the workers increased in numbers the matter of sales policies gave much trouble and it was found necessary to incorporate as a stock company. Perusal of the replies gave the idea that many manufacturers believe the shop committee organization will overcome unionism by forming a union locally which will dominate the situation. The consensus of the convention is that this is a false expectation.

As to the scope of the shop committee in handling matters some concerns allow it to deal with only wages and hours; others expect the committee to spread enthusiasm and obtain co-operation. Other matters handled by the committee in various instances are usual employe relations, wages, hours and working conditions, grievances only and any of the following: Rules, hours, safety, methods and economy, wages, bonus, working conditions, housing, health, pensions, athletics and recreation.

The fundamental principles to be considered in the formation of the shop committee are found to be as follows: Unit of representation, method of election, qualifications of voters, personnel and scope of joint conference, provision for appeals, guarantee against discrimination, executive supervision.

It was found from the replies that 30 per cent has a co-operative management plan in operation, 2 per cent has one ready, 3 per cent has restricted representation, 1 per cent has discarded the plan. Answers revealed that 52 per cent has no plan but is considering adoption of one and that 5 per cent has no co-operative plan but a profit-sharing scheme.

As to length of experience of a co-operative plan in action the following results were obtained: Less than six months, 16 per cent; less than nine months, 4 per cent; one year, 32 per cent; two years, 24 per cent; three years, 16 per cent; four years, 4 per cent; five years, 5 per cent. Committees are appointed by the management in 20 per cent of the cases, by the workers in 40 per cent and by a combination of both in 40 per cent.

In 12 per cent an organization similar to a senate and house of representatives is followed. Units of representation were various, in some cases each 100 men having one representative and in others each department having one delegate. In 30 per cent of the replies workers in the office force were represented and in 16 per cent the sales force was represented. In reply to the question as to qualifications for election 25 per cent requires American citizenship and 50 per cent places no restriction on length of service. In other cases 60 days, six months and a year are required. It is found that appeals are settled by many methods, being made in various instances to the president, general manager or superintendent or all three or an executive committee of officers and an equal representation from the shops.

In reply to the question whether co-operative management has created teamwork 90 per cent answered in the affirmative while 55 per cent finds production is stimulated. Personal classification schemes are in use in 8 per cent of the plants answering, 8 per cent has such systems ready to install and 33 per cent is considering their adoption.

Magnus W. Alexander, of the Industrial Conference board, Boston, sounded a keynote which was echoed many times during the convention. He believes that no matter how fine a mechanism is created it will be of no avail unless it is actuated by the right spirit. There must be confidence on both sides. When the right spirit has been injected the mechanism becomes an organism, a living thing and personality makes it alive. The personality and humanity of the men in authority means so much that it is more important than the plan or the mechanism. F. A. Carlisle, of the Friedlander-Brady Knitting Mills, described the organization in his plant, the federal government plan being followed as closely as possible. L. W. Wallace, president of the Society of Industrial Engineers, spoke on the spirit behind the plan. E. S. Cowdrick, assistant to the president of the Colorado Fuel & Iron Co., Denver, described the plan of employes' representation in effect in that company's plants. This plan was given extended description recently in THE IRON TRADE REVIEW.

Exodus Gives Concern

The exodus of foreign labor from Steubenville, O., has begun to reach proportions that give employers considerable concern. Since the armistice was signed it is said, more than 400 workmen, mostly Italian and Serbian have left and hundreds more either have applied for passage or are making preparation to return to their native lands. The movement is expected to increase with the signing of the peace treaty and the lifting of the restrictions which prevent citizens of enemy countries from securing passports.

At the recent annual meeting of the Steel Co. of Canada, Hamilton, Ont., a pension fund for employes was established.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

EVAN F. JONES has been appointed president and general manager of the Clinton-Wright Wire Co., Worcester, Mass., the corporate style of the recent merger of the Wright Wire Co., Worcester and Palmer, Mass., the Morgan Spring Co., the National Mfg. Co., the Miller Wire Cloth Co., all of Worcester, and the Clinton Wire Cloth Co., Clinton, Mass. He is a native of Chicago and is 53 years old. He formerly was purchasing agent of the International Harvester Co., in Chicago and later removed to Birmingham, Ala., where he was identified with the Birmingham Steel Co. About 11 years ago he located in Worcester, Mass., as general manager of the Morgan Spring Co.

John T. Fuller now is affiliated with the American Bauxite Co., Bauxite, Ark.

Benjamin C. Page has accepted the position of superintendent of the Sheffield plant of Fairbanks, Morse & Co., Three Rivers, Mich.

E. G. Grace, president of the Bethlehem Steel Corp., has been elected a director of the Guaranty Trust Co. of New York.

Edward D. Frohman, Pittsburgh manager for the S. Obermayer Co., recently left for an extended tour of the west, including Yellowstone Park.

V. K. Glidden, formerly attached to the Cleveland office of the Bourne-Fuller Co., recently took up his duties on the sales force of the Pittsburgh office of that company.

C. W. Engle, chief engineer of the Central Steel Co., Massillon, O., has resigned. He expects to take a vacation before again engaging in active business.

John McConnell who has charge of alloy steel production for the Interstate Iron & Steel Co., Chicago, was elected vice president at a recent meeting of the board of directors.

T. L. Lewis, who recently resigned as general manager of sales of the A. M. Byers Co., Pittsburgh, on July 1 will assume his duties as manager of sales of the Interstate Pipe Co., Pittsburgh, distributor of oil country goods.

H. E. Copeland, who for the past five years was chemist and metallurgical engineer for the Lenoir Car Works, Lenoir City, Tenn., has accepted a position as chemical engineer with the Hill & Griffith Co., Cincinnati.

Ralph V. Davies has accepted a position in the technical control department of the Aluminum Co. of America, New Kensington, Pa.

Roland Gerry, manager of sales, cold rolled department, Jones & Laughlin Steel Co., Pittsburgh, is attending the annual convention of the Master Car Builders association at Atlantic City.

EVAN F. JONES

Samuel Hoyt has resigned as assistant professor of metallography, University of Minnesota, Minneapolis, to accept a position of metallographist for the National Electric Lamp association, Nela Park, Cleveland.

John A. Guy is now superintendent of the steel plant of the American Radiator Co., Buffalo. Previously he was connected with the Ludlum Steel Co., Watervliet, N. Y., where he had charge of the iron and steel foundry.

John C. Theise, formerly assistant superintendent with McIntosh & Seymour Corp., Auburn, N. Y., has been placed in charge of the brass foundry at the Harrison, N. J., works of the Worthington Pump & Machinery Corp.

T. B. Foust resigned as superintendent of the furnace department of the Bon Air Coal & Iron Corp., Lyles, Tenn., to assume active charge on June 1 of the Clarkville Foundry & Machine Works, of which he is president.

G. S. Alston, who for the past three years has been auditor of the Sharon, Pa., plant of the American Steel Foundries, has been transferred to the Alliance, O., plant of that company, and A. C. James has been named to succeed him as auditor of the Sharon plant.

Charles J. Stott, who at one time was superintendent of the Valley and Viaduct mills of the Worth Bros. Co., and the Midvale Steel & Ordnance Co., is vice president, in charge of the scrap yard recently established at Coatesville, Pa., by Henry Potts & Co., 650 Real Estate Trust building, Philadelphia.

R. J. Wysor has been made assistant general manager of the Sparrows Point, Md., plant of the Bethlehem Steel Co., Bethlehem, Pa., to succeed M. J. Scammell, who resigned recently. Mr. Wysor has been employed by the Bethlehem company as superintendent of its B. P. & N. E. railroad.

Lieut. Col. Merrill G. Baker, whose election to the presidency of the American International Steel Corp., New York, exporting subsidiary of the American International Corp., was announced in a recent issue of THE IRON TRADE REVIEW, has resigned that connection.

Dr. John A. Mathews, president of the Halcomb Steel Co., Syracuse, N. Y., sailed recently for Europe. He is a member of the war department's aircraft standardization committee, which is headed by Assistant Secretary of War Crowell, and which is to study the standardization of aircraft building in Europe.

L. K. Goss of Cleveland has joined the sales force of the Tacony Steel Co., Philadelphia, and will act as assistant to Mr. Keefer, the Cleveland district sales manager. Mr. Goss, who has just left the ordnance department, formerly was manager of the small tool department and connected with the sales force of the Warner & Swasey Co., Cleveland.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

NORRIS JAY CLARKE, as announced in THE IRON TRADE REVIEW of June 19, has resigned his affiliation with the Upson Nut Co., Cleveland, to become president of the Lake Erie Bolt & Nut Co., that city, capitalized at $2,500,000, effective July 1. After obtaining a grade in high school education in Cleveland, Mr. Clarke was employed by the Bourne-Fuller Co., as office boy in 1896. He was advanced through various positions until 1903 when he became salesman. In October, 1905, he was made manager of the Bourne-Fuller Co.'s office in Pittsburgh and in January, 1912, was elected secretary and director of the Upson Nut Co. In December, 1918, he was elected vice president and secretary of the Upson company, retaining his place on the board of directors, retaining those titles until his recent resignation. He also is treasurer and director of the Steel Car Co., Euclid, O. Mr. Clarke entered the ordnance department of the United States army, in the artillery ammunition metal components division in August, 1918, with the rank of major, and resigned in Dec., 1918.

Charles L. Doyle, who has been looking after the coke supplies for various blast furnace interests, has returned to his former activity of selling coal and coke. Effective July 1, with headquarters in the Oliver building, Pittsburgh, he will largely assume the sale of the Oliver & Snyder Steel Co.'s products, both coal and coke.

Professor J. R. Allen has resigned as dean of the College of Engineering, University of Minnesota, Minneapolis, to become director of the Research Bureau of the American Society of Heating and Ventilating Engineers, Pittsburgh. This organization has appropriated $80,000 for special research on heating and ventilating problems during the forthcoming year.

M. V. Dreyspool has been appointed general manager of sales for Rownson, Drew & Clydesdale, 68 William street, New York exporters. Mr. Dreyspool first was with the Central of Georgia railway, and in 1903 entered the purchasing department of the New York Central railroad. In 1905 he became the New York representative of the Phoenix Iron Co., remaining with it for 10 years. He entered the steel export field in 1915.

Maj. F. H. Schoenfuss, lately discharged as metallurgical expert from the United States ordnance department where he had charge of the specifications for and the heat treatment of all parts of various types of guns, has become associated with John H. Brewster, 30 East Forty-second street, New York City, American representative of the Fagersta Steel Co., Fagersta, Sweden, maker of carbon and alloy steels.

NORRIS J. CLARKE

Laurence Mouat has been appointed contract sales manager of the P. & F. Corbin division of the American Hardware Corp., New Britain, Conn., to fill the vacancy caused by the resignation of R. N. Hemenway. Mr. Mouat for several years was connected with the Corbin office on the Pacific coast. George Overstrom, of the Chicago office of the corporation, will have the position formerly filled by Mr. Mouat.

R. T. Harris recently assumed the position of superintendent of the steel works of the Heppenstall Forge & Knife Co., Pittsburgh. He has been connected with the open-hearth plants of the Indiana Steel Co. at Gary, Ind., the Bethlehem Steel Co., and the Llewelyn Iron Works, San Pedro, Cal. During the war Mr. Harris was a supervisor of steel for the ordnance department with headquarters in Washington.

William Fellowes Morgan has been re-elected president of the Merchants' Association of New York. All other officers were re-elected for another year as follows: First vice president, Lewis E. Pierson, chairman of the board of directors of the Irving National bank; second vice president, James Gilbert White; third vice president, William Hamlin Childs; treasurer, Silas D. Webb; secretary, S. C. Mead.

J. W. Oliver, who as noted in the May 22 issue of THE IRON TRADE REVIEW, was appointed secretary of the Sanitary Mfg. Co., Pittsburgh, was tendered a dinner at the Pendennis club, Louisville, Ky., by the board of trade of that city, recently, prior to his departure for Pittsburgh. He has been manager of the Louisville plant of the Standard Sanitary company and served as president of that city's board of trade for two years.

Maj. Jonathon Jones, 1903 College University of Pennsylvania, who for a number of years was engineer of the Pottstown, Pa. plant of the McClintic-Marshall Co., Pittsburgh, and upon severing that connection, bridge engineer of the city of Philadelphia, has been suggested for the position of professor of civil engineering of the University of Pennsylvania. For the last two years, Major Jones has been in France, with the American expeditionary forces, being attached to the 23rd division of engineers.

William G. O'Malley, who severed his connection with the Pittsburgh Crucible Steel Co., Midland, Pa., recently, had been located there since 1913 when he commenced as general master mechanic. In October, 1916, he was promoted to be general works manager, in which position he served until his recent resignation. Prior to locating in Midland, he was affiliated with the Lackawanna Steel Co. for about 25 years, starting as machinist's apprentice and rising to the general superintendency.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

C S. COLER has been appointed manager of the educational department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. After he was graduated from Cornell university in 1911, he entered the graduate student course at the Westinghouse plant and in early fall of that year, was appointed director of mechanical drawing in the Casino technical night school, supported by the Westinghouse company. After three years as instructor, he was appointed manager of the entire evening school and director of trades training of the company. He retained that position until his recent promotion to the position of manager of the company's educational department and president of the Casino technical night school, to succeed C. R. Dooley, who resigned to promote educational work in the Standard Oil Co.'s organization. Mr. Coler is president of the Pittsburgh chapter of the National Association of Corporation Schools, a member of the Society for Promotion of Engineering Education and chairman of the technical sections of the Westinghouse club.

F. T. Snyder resigned on June 1 as vice president of the Industrial Electric Furnace Co., 53 West Jackson boulevard, Chicago.

Earl B. Wilson has been appointed director of sales for the Buick Motor Co., Flint, Mich. He formerly was manager of the Philadelphia branch.

C. C. Thomas has resigned from the experimental engineering department of the Denby Motor Truck Co., Detroit, to become chief engineer of the Fields Mfg. Co., Owosso, Mich.

L. P. Helm has been appointed manager of production of the Chief Motors Corp., Port Huron, Mich. He formerly was connected with the Olympian Motors Co., Pontiac, Mich.

H. L. Wadsworth has resigned as manager for the American Foundry Equipment Co. and Sand Mixing Machine Co., Inc., combined, with headquarters at the factory in Cleveland.

John A. Baker, for the past six years assistant general superintendent of the Mesta Machine Co., Pittsburgh, has resigned to accept a position with the Kroyer Mfg. Co., Stockton, Cal.

Lynn McNaughton has been made general sales manager for the Cadillac Motor Car Co., Detroit, to succeed E. C. Howard, resigned. Mr. McNaughton has been with the Cadillac company for 14 years.

L. S. Devos with headquarters at 24 Stone street, New York City, now is export manager for the Becker Milling Machine Co., Hyde Park, Boston; the Reed-Prentice Co., and Whitcomb-Blaisdell Co., Worcester, Mass.

Bruce E. Anderson, formerly of the Ideal Engine Co., Lansing, Mich., has been appointed general manager of the Lansing Body Co., that city, manufacturer of automobile bodies. He succeeds Frank Thoman, founder of the company, who has resigned.

L. M. Moser, who formerly was foundry superintendent of the Hamilton Machine Tool Co., Hamilton, O., has been made general superintendent of the Advance Foundry Co., Dayton, O., of which A. H. Kramer is president.

F. G. Echols has been appointed vice president of the Greenfield Tap & Die Corp., Greenfield, Mass. For many years he has been general manager of the small tool department of the Pratt & Whitney Co., Hartford.

A. Borsuk, who for two years has been superintendent of the Presto Machine Works, Inc., Brooklyn, N. Y., now fills a similar capacity with the Presto Phono Parts Corp., an allied interest, of which he has been elected vice president.

A. D. Somers has been appointed night superintendent for the New Departure Mfg. Co., Bristol, Conn. For the past year he has been with the H. C. Cook Co., Ansonia, Conn., and prior to that time he was superintendent of the C. J. Root Co., Bristol.

George W. Parks has been appointed head of the Maxwell Motor Co.'s development plans in Canada, which include erection of a branch of the Detroit plant in Windsor, Ont. He formerly was president of the George W. Parks Co., of New York, manufacturing silversmith.

Lieut. Com. Edward R. Mason, formerly assistant chief of the ordnance department of the Midvale Steel & Ordnance Co., has been made sales manager of the forging department of the Bonney Vise & Tool Works, Inc., Allentown, Pa. He will spend part of his time in Detroit.

Albert Brunt, who for the past four years has been employed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in its industrial engineering department as engineer in charge of the direct-current machine design, resigned recently to return to Holland.

F. O. Wells, president of the Greenfield Tap & Die Corp., Greenfield, Mass., plans to sail about July 1 for a trip to Paris and London. While abroad he will attend the world congress on the standardization of screw threads to which subject he has given much time for several years.

George P. Dempler has resigned as general manager of the Fiber Barrel Machinery & Mfg. Co., Pittsburgh, effective June 30. He is to become mechanical engineer in the valve department with the J. V. Walsh Co., Pittsburgh, which will place a full line of valves on the market soon.

Rear Admiral George W. McElroy, for the past three years inspector of machinery at the Fore River yards of the Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass., has been detached and ordered to New York in connection with ordnance inspection duties.

Maj. George W. Semmes, vice president and chief engineer of Akerlund & Semmes, Inc., 17 Battery Place, New York, manufacturer and installer of various types of gas producers, has returned from France, after an absence of nearly a year, during which time he saw much active service at the battle fronts. He will have charge of the gas producer department.

Alfred Crook, vice president and general manager of the Philadelphia Roll & Machine Co. and the Tioga Steel & Iron Co., Philadelphia, has returned from Europe, after an absence of several months. He has been investigating foreign trade conditions in the interests of the two companies which are subsidiaries of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., of which Mr. Crook is vice president.

War Remakes Steel Map of Europe

Destruction of Many Plants and Germany's Cessions Under Peace Treaty Effect Great Shift in National Line-Up of Industry—French and Belgian Prospects—Germany's Future Position—Trade Significance for United States

BY A. O. BACKERT

WHAT will be the effect upon the iron and steel trade of the United States of the tremendous changes wrought by the war on the European iron and steel industry?

To what extent will stricken Belgium and France requisition the aid of American manufacturers to compensate them for their losses in iron and steel producing capacity?

What are the export possibilities for American iron and steel products to the United Kingdom?

What will be the immediate and future rank of France among the leading iron and steel producing nations of the world with the reannexation of Alsace Lorraine, and its wealth of iron ore and going iron and steel plants?

And what about Germany, stripped of her sovereignty over Luxemburg and the loss of Upper Silesia and Alsace Lorraine? All of these territorities contributed a large part to the total of Germany's iron and steel output and enabled her to occupy a position in the world's iron and steel trade, second only to the United States. The control of the iron and steel plants of the Saar also is in question, and if the peace treaty cedes them to France, then Germany loses heavily in blast furnaces and steel works.

What future position will Germany occupy among the iron and steel producing nations of the world and will she again be the potent factor in the export trade that she was before the war?

Among the leading iron and steel producing countries, the United States and England alone were able to improve their positions materially by the erection of new plants throughout the period of the war, although Italy, Sweden and Japan added considerably to their capacities. On the other hand, Belgium and France, as a result of the German invasion, suffered losses in producing capacity of about 5,600,000 tons annually in pig iron and of about 5,100,000 tons annually in steel. Belgium has received no compensation such as that obtained by France and it is estimated that five years will elapse before she will again attain the tonnage produced in 1913. France, through the acquisition of Alsace Lorraine, will slightly exceed her prewar pig iron producing capacity, but she still suffers a loss of more than 300,000 tons in steel-making output. Germany, shorn of Luxemburg, Upper Silesia and Alsace Lorraine, it is estimated will be reduced to a pig iron producing capacity of 11,000,000 tons and about 14,000,000 tons of steel, but to attain this production she will be compelled to operate on a prewar basis. This is inconceivable with France in control of so large a part of Germany's necessary raw materials. How nearly Germany may be able to approach these figures is entirely dependent upon France. It is doubtful if France will display any undue liberality in the sale of iron ore to Germany to enable her bitter rival to compete with her at her expense. To take full advantage of her acquired iron ore and other raw material resources, France must rebuild the destroyed plants in her northern and eastern districts and this, it is estimated, will require from three to five years. In computing the foregoing estimate of Germany's tonnage, the control of the Saar blast furnaces and steel works is left to the Germans, but this might be changed by the peace treaty.

Germany, stripped of a large part of her raw material and a big percentage of her blast furnaces, rolling mills and steel works, will still have a producing capacity equal to, if not greater than that of the United Kingdom. British ironmasters are of the opinion that Germany, because of her reduced output, no longer will be a factor in the world's export iron and steel trade and that whatever surplus material she may have will be distributed only east of her borders and will not be sent westward in such large quantities as before the war. France has never figured as a large exporter of pig iron and rolled iron and steel products and Belgium, although having had a large export trade, in proportion to her production, before the war, cannot again be considered as a competitive export trade factor for at least five years. This leaves the United States and England in control of the world's export trade, aside from the countries lying directly east of the new boundaries of Germany. As compared with the production of 1913, the present output of the United Kingdom, France, Germany and Belgium shows a decline of about 1,000,000 tons of pig iron and steel, respectively, per month. How will this deficiency be supplied and what nation or nations will supply it?

Notwithstanding the high prices for iron and steel products prevailing in England, her manufacturers hold the key to the continental iron and steel export situation. No tariff wall could bar out more effectively American iron and steel products than the high

An Expert Survey

MUCH has been written regarding the far-reaching changes which the world war has stamped permanently upon the iron and steel industry of Europe. Probably no commercial question arising out of the reconstruction period has a greater importance or more direct connection with the international trade position of the United States than these war-wrought effects. A. O. Backert, vice president of the Penton Publishing Co., whose wide experience and practical knowledge of the commercial and manufacturing sides of the iron and steel industry eminently qualifies him for this study, sets forth in the accompanying article a complete and thoughtful analysis of this metamorphosis of European national industry. This article is based upon investigations by the author of European conditions carried forward during a several months' tour from which he has just returned. As president of the American Foundrymen's association and editor of THE FOUNDRY, *Mr. Backert was accorded exceptional opportunities for personal observation and had access to sources of information denied the average correspondent or business man. His article, accordingly, is the most comprehensive and essentially the most authoritative that yet has been presented on this subject.*

ocean freight rates now prevailing, which more than compensate for the difference in the prices quoted in the United States and in England. Ocean shipping is the key to the situation and unless more liberal rates are made, England will remain in control of the continental iron and steel export situation; nor will her manufacturers buy American pig iron and steel in quantity except at big concessions from prices now quoted in the United States, and sufficient to wipe out the freight-carrying charge that more than represents the spread between English and American iron and steel prices. Since 1913, the annual steel production of the United Kingdom has increased from 7,664,000 to 9,591,000 tons, although her pig iron production declined from 10,260,000 to 9,066,000 tons during this period. English rolling mills are buying some sheet and tin plate bars and some pig iron is required, but it is difficult for our iron and steel manufacturers to compete as long as the present high ocean rates continue.

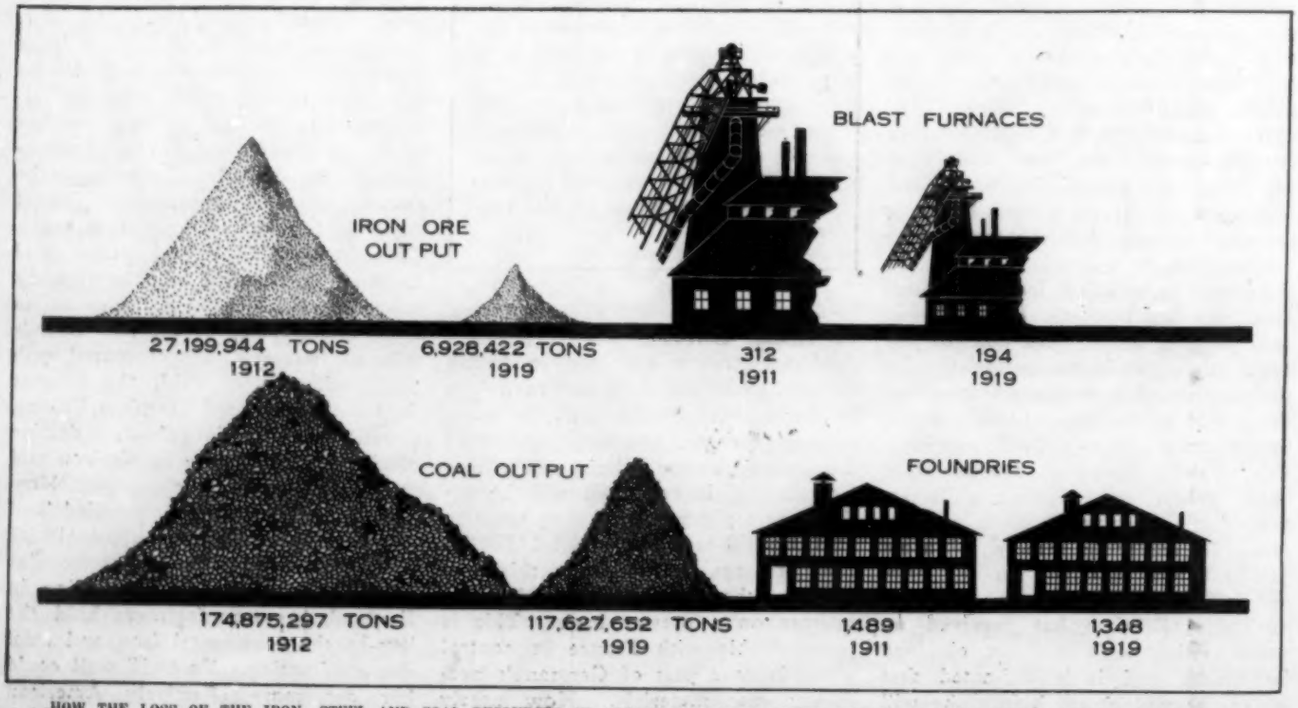
However, British imports of iron and steel today are negligible. According to statistics issued by the government for the month of April the imports of pig iron amounted only to 2533 tons as compared with 15,351 tons in April last year, while the imports of blooms, billets and slabs, and sheet and tin plate bars totaled slightly more than 1000 tons. The imports of wire rods aggregated 2416 tons; hoops and strips, 1525 tons and wire nails, 2348 tons and the total iron and steel imports, excluding ore, amounted to 14,367 tons in April against 25,435 tons in the same month last year. Exports for April, on the other hand, showed a big gain over the same period in 1918. The total iron and steel exported, excluding ore, but including scrap, was 173,606 tons as compared with 135,927 tons in the same period last year. For the first four months of this year the exports totaled 613,622 tons against 527,724 tons last year. These figures are indicative of how Great Britain is recovering her export iron and steel trade and to what an extent she has made herself independent of outside sources of iron and steel supply throughout the period of the war.

British Industry Reawakened

Furthermore, the war has energized the entire British iron and steel industry and many notable new installations are being made that will increase both steelmaking and rolling mill capacities. The most important of these is the addition to the plant of Steel, Peech & Tozer, Sheffield, described in THE IRON TRADE REVIEW, April 3, 1919, page 879. It will consist of 14 open-hearth furnaces of 60 tons capacity each, with an annual estimated output of 300,000 tons. A Morgan rod mill of the continuous type with an annual output of 75,000 tons will considerably reduce the British shortage of rods and, in addition, two continuous billet mills are being installed. Cammel Laird & Co., Sheffield, also are adding fourteen 60-ton open-hearth furnaces with an estimated output of 300,000 tons of steel annually and the two additions noted will add 600,000 tons a year to the steel production of the United Kingdom. An annual steelmaking capacity of 12,000,000 tons is the British hope of attainment within two years.

The British iron and steel industry also is doing its share toward restoring the normal rate of exchange which is now on the basis of $4.65 per pound sterling. With the balance of trade so greatly in favor of the United States, it is realized that British exports must exceed imports to re-establish the normal exchange rate and the iron and steel export and import figures, previously quoted, indicate to what an extent the iron and steel trade is helping in the restoration of the trade balance. Furthermore, the depreciated sterling value exacts an additional premium of about 5 per cent from the prospective British iron and steel buyer and this is a further contributing factor that weighs considerably against American iron and steel exports to the United Kingdom. The removal of license restrictions on iron and steel products by the British board of trade has not resulted in any increase in imports from the United States.

To restore what even remotely approaches the normal dollar and sterling exchange value of the franc is the problem which French financiers and treasury officials are attempting to solve. During the period of the



HOW THE LOSS OF THE IRON, STEEL AND COAL RESOURCES OF ALSACE LORRAINE, UPPER SILESIA AND POSSIBLY OF THE SAAR REGION, REDUCES GERMANY'S STANDING AS AN INDUSTRIAL NATION

war, and for several months after the armistice was signed, the exchange rate of the franc was guaranteed at 5.45 by the United States government. Several months ago this guarantee was withdrawn and a sharp decline in the value of the franc followed. While the exchange rate fell as low as 6.60 and even slightly less, it has fluctuated around 6.50 for some time. It was believed that by restricting imports the exchange rate might be restored, yet the virtual embargo on machinery and equipment is proving embarrassing to French industry, and reconstruction, so much needed, is being deferred by this policy. However, the figures covering imports during the first three months of this year, recently issued by the French government, show a tremendous increase over normal, while the exports for the month of January are 75,995,000 francs less than the same month last year. The normal, prewar imports for the first quarter of the year of iron ore, pig iron and steel were 10,000,000 francs, whereas this year they were 310,000,000 francs, an incease of 300,000,000 francs. The imports of machinery increased from a normal quarterly rate of 74,000,000 francs to 150,000,000 francs; tools from 21,000,000 francs to 157,000,000 francs and automobiles from 3,000,000 to 63,000,000 francs.

The foregoing figures are all the more startling because of the import restrictions in effect throughout this quarterly period. On May 25 the licensing requirements were removed from iron and steel products and nonferrous metals, but they still remain in effect on machinery and all kinds of metalworking equipment. The total exports for January, this year, were valued at 1,000,053,000 francs as compared with 1,076,048,000 francs for January, 1918. This decline in the value of exports of 75,995,000 francs was unexpected, particularly in view of the termination of the war.

Both France and Belgium will be compelled to import hundreds of millions of dollars worth of iron, steel, machinery and equipment to restore their destroyed industries, yet with the rate of exchange so much against them, they not only will be compelled to pay the high prices for these products and tools as compared with prewar costs, but an additional premium of 25 per cent will be exacted from them by the disparity in the exchange rate. This will increase by one-fourth the cost of rehabilitating the industries of these countries, to which must be added the doubled cost of all material as contrasted with prewar prices. It has been suggested by French financiers that the rate of exchange again be guaranteed, as otherwise the price of reconstruction will attain figures never before conjectured. Although not definitely stated, it has been intimated that further enormous loans will have to be made to France and Belgium and it is pointed out that only by creating a credit in this way will it be possible for them to make their purchases from the countries that make the loans.

Indicative of the tremendous financial burden which France is carrying attention is directed by her financiers to the tremendous increase in the debt of the nation due to the war. Before the German aggression, the national debt of France was 29,800,000,000 francs, equal to $5,960,000,000, figuring 5 francs to the dollar; on April 1, this year, this had grown to 174,815,000,000 francs, or $34,963,000,000 and on June 1 the total national indebtedness had been increased to 200,000,000,000 francs, or $40,000,000,000.

It is estimated, as previously stated, that the loss in continental iron and steel production, due to German destruction of blast furnaces and steel works aggregates annually 5,600,000 tons of pig iron and 5,100,000 tons of steel. Of these totals France has been robbed of 3,300,000 tons of iron and 2,800,000 tons of steel and Belgium approximately 2,300,000 tons of iron and steel, respectively. For a year at least iron and steel production will suffer these losses, although the Belgian ironmasters are sanguine of regaining 44 per cent of their prewar blast furnace capacity in the next 12 months. Assuming that a similar gain will be made in steel production, then the pig iron and steel output of Belgium in 1920 each should approximate 1,100,000 tons. In 1913, the Belgium produced 2,476,700 metric tons of pig iron and 2,466,630 tons of steel including 61,850 tons of steel castings. The output declined to 1,454,500 tons of pig iron in 1914, the first year of the war, when 1,360,000 tons of steel also were produced. Practically this entire output is credited to the first seven months of that year. Statistics for 1915 and 1916 are rather uncertain, although the pig iron production is placed at 68,150 and 127,825 tons, respectively, and the steel output for 1915 was estimated at 110,180 tons and for 1916, 137,590 tons. No figures are available covering the last two years. On Aug. 1, 1914, Belgium had 49 of its 60 blast furnaces in operation, whereas on armistice day only four stacks were intact, representing a total of 6.3 per cent of the pig iron producing capacity of the country. It has been estimated by

War's Effect Upon the World's Industry

THE United States and Great Britain greatly increased their steel producing capacities and today are in control of the world's export iron and steel trade. Among the smaller nations, Japan, Italy and Sweden made important additions to their iron and steel plants.

Last year the United Kingdom produced nearly 10,000,000 tons of steel and an effort is being made to increase the output to 12,000,000 tons annually.

Iron and steel plant destruction in France and Belgium reduced the annual theoretical pig iron and steel output of these countries 5,100,000 tons, respectively.

By the reannexation of Alsace Lorraine, France gains 71,000 tons of her annual prewar pig iron output, but still suffers a loss of 322,000 tons per year in steel production.

Germany's pig iron output the first four months of this year was at the rate of less than 6,000,000 tons annually, as compared with a production of more than 19,000,000 tons in 1913. Germany's steel production today is at the rate of 6,500,000 tons annually, against 18,959,000 tons the year before the war.

The iron and steel production of the United Kingdom to May 1, this year, shows a big decline over the same period last year. The shortage of labor, due to the inaugural of the 8-hour day is assigned as the cause of this loss in output.

Prices of iron and steel products in all European countries are much higher than those prevailing in the United States. However, the United States is at a big disadvantage in selling to these nations because of high ocean freight rates. These more than compensate for the difference in iron and steel quotations in the United States, England and France.

The reduced exchange values of the franc and the shilling exact additional premiums of 25 per cent on purchases made in the United States by France, and 5 per cent on exports to Great Britain.

All import restrictions on iron, steel, machinery and equipment have been removed by Great Britain. France has lifted license requirements on iron, steel and nonferrous metals, but still restricts imports of tools and machinery.

Leon Greiner that within a year 44 per cent of Belgium's blast furnaces will again be in operation and it may be assumed that the steel works will be rehabilitated to approximately the same degree during this period. The prewar, war and peace statistics of the Belgian iron trade in metric tons are as follows:

PIG IRON

1913	2,476,700
1914	1,454,500
1915	68,150
1916	127,825

Figures are not available for 1917 and 1918 and it is doubtful if the output this year will total 500,000 tons. If the estimate of Leon Greiner is fulfilled next year, then Belgium will have an output of about 1,100,000 tons of iron in 1920, but still will be suffering a loss of nearly 1,400,000 tons as compared with the prewar period.

Statistics of Belgium's steel production may be similarly considered

STEEL

1913	*2,466,630
1914	1,360,000
1915	110,180
1916	137,590

*Includes 61,850 tons of steel castings.

Figures are not available for 1917 and 1918, although it is fair to assume that upon the retirement of the Germans, steel production was not on a much greater scale than the pig iron made. If 44 per cent of the steel capacity is to become productive within 12 months, then in 1920, Belgium should produce approximately 1,100,000 tons, still leaving a loss of 1,380,000 tons annually as compared with the prewar period. By those who have visited the destroyed Belgian iron and steel works it is considered extremely doubtful if the can be placed on 50 per cent of their prewar productive bases within two years, and it is estimated that five years will be required to restore the industry to the position occupied before the German invasion.

Raw Materials Make Gain

Glowing predictions of France's imminent European iron and steel supremacy as the result of her acquisition of German Alsace Lorraine are indulged in freely, but these are not borne out by available statistics. In raw materials France has made tremendous gains, but her blast furnace and steel works capacity must be practically doubled to place her on an equal footing with England and she will still then trail Germany without further additions to existing capacity. In 1913 the pig iron a steel production of France attained its high mark. Her 170 blast furnaces produced 5,207,000 metric tons of pig iron and the steel production totaled 4,687,000 tons. In the invaded districts, 85 blast furnaces were demolished, leaving 85 in operation, but the iron producing capacity was reduced 64 per cent. The iron production lost was estimated at 3,700,000 tons annually and the figures of iron production during 1916, 1917 and 1918, bear out this loss fairly accurately. No figures are available for 1914 and 1915 and it is doubtful if these can be compiled at this time, because the work of gathering these statistics was undertaken by the government immediately after hostilities commenced and only recently was turned back to the Comite des Forges.

BLACK SPOTS ON THE MAP SHOW THE DISTRIBUTION OF IRON AND STEEL PRODUCTION OF THE NEW GERMANY

The statistics covering 1913 and three of the war years in metric tons are as follows:

PIG IRON

	Production	Loss compared with 1913
1913	5,207,000	.....
1916	1,447,000	3,760,000
1917	1,684,000	3,523,000
1918	1,297,000	3,910,000

Loss, three-year average, 3,731,000 tons.

In 1913, the steel works of France attained their record output with a total of 4,687,000 metric tons. The bessemer converters totaled 100 of which 47 were destroyed leaving a total of 53 in operation today. Before the German invasion France h 164 open-hearth furnaces of which 116 were in the war-devastated territory and only 48 of these are now in operation. The steel production lost to France by the war was approximately 60 per cent or an average of about 2,622,000 tons annually. These figures have been obtained from the following statistics, in metric tons:

STEEL

		Loss as compared with 1913
1913	4,687,000	.....
1916	1,952,000	2,735,000
1917	2,232,000	2,455,000
1918	1,912,000	2,675,000

Average loss, 2,622,000 metric tons.

As the result of the reannexation of Alsace Lorraine, France gains approximately 3,800,000 tons of pig iron and 2,300,000 tons of steel producing capacity annually. This nets a slight gain in iron output over a loss of 3,731,000 tons, but still nets a loss in the steel capacity of 322,000 tons annually. Considering losses and gains based on the production of 1913, France now has the following iron producing capacity in metric tons:

PIG IRON

1913	5,207,000
Average loss	3,731,000
Net capacity	1,476,000
Gain by Alsace Lorraine	3,800,000
Present capacity	5,276,000

This gives France a pig iron producing capacity of 5,276,000 tons annually or 71,000 tons in excess of her 1913 output.

Analyzing France's steel production similarly, we arrived at the following figures in metric tons:

STEEL

1913	4,687,000
Average loss	2,622,000
Net capacity	2,065,000
Gain by Alsace-Lorraine	2,300,000
Present capacity	4,365,000

This gives France a present steel producing capacity of 4,365,000 tons as compared with 4,687,000 tons in 1913, a loss of 322,000 tons. The destruction to the plants in northeastern France is more complete than that of the plants in Belgium and it is doubtful if some of these will be rebuilt. It has been variously estimated that it will require from three to five years to restore this region to its prewar state of activity.

One of the principal acquisitions by France is the famous Thyssen Works at Hagondayge in the Metz-Thionville district. The plant was in process of completion at the outbreak of the war and only came into production early in 1915. It consists of six blast furnaces, five bessemer converters and three open-hearths and has a capacity of 2000 tons of steel daily. The rolled output consists of slabs, sheet bars, shapes, and rails.

According to a compilation recently made by the British financial commission, Germany's losses in Upper Silesia, and Alsace Lorraine represent 32.7 per cent of her coal output; 72.4 per cent of her iron ore, 74.7 per cent of her zinc and 37.8 per cent of her blast furnaces. Exclusive of Luxemburg, Germany had 330 blast furnaces at the end of 1913. In the Saar and Lorraine regions there are 81 furnaces and 37 in Upper Silesia, representing a loss of 118 stacks. In 1913 Germany also had 1574 iron, steel and malleable foundries and she loses 213 of these in the ceded territories.

In 1913 the German empire produced 19,291,920 tons of pig iron including Luxemburg which had a total of 2,547,859 tons for that year, leaving a net output of 16,744,061 tons for Germany. If from this total 3,800,000 tons, representing the output of Alsace Lorraine, is deducted, it leaves a total of 12,944,061 tons for Germany, including Upper Silesia. Unfortunately statistics are not available of the production of this territory, but it is estimated, when based on the high-mark 1913 production figures, that Germany will have a maximum pig iron producing capacity of about 11,000,000 tons, assuming that she retains the blast furnace capacity of the Saar region, which is a matter of doubt.

In 1913 Germany also attained a record steel production with a total of 18,958,819 tons. This included 1,182,226 tons for Luxemburg, and deducting this total, leaves 17,776,593 for Germany proper. Of this Alsace-Lorraine, now reannexed to France, is credited with 2,300,000 tons, leaving a net steel producing capacity for Germany of 15,476,593 tons. With the loss of Upper Silesia it is estimated that Germany will have a producing capacity of 14,000,000 tons of steel based on the 1913 output with the capacity of the Saar region included. However, during the war Germany's iron and steel production declined markedly as the following figures in metric tons show:

	PIG IRON	STEEL
1913	19,292,000	18,959,000
1914	14,392,000	14,973,000
1915	11,790,000	13,258,000
1916	13,285,000	16,183,000
1917	13,142,000	16,587,000
1918	*11,590,000	*14,874,000

*Including Luxemburg up to October, 1918. The returns for November and December, 1918, do not include the production of Luxemburg, Saar district and the disannexed Lorraine province.

The estimates of 11,000,000 tons of pig iron and 14,000,000 tons of steel for Germany are liberal, inasmuch as these figures are based on prewar production. Considering war-year performance, the capacity more nearly approaches 8,000,000 tons of pig iron and 11,000,000 tons of steel. These estimates also are borne out by the figures of monthly averages of output now available for the first four months of this year. In January, the pig iron output had declined to 501,208 tons and in February, 469,200 tons; March showed an increase to 545,939 tons, but April had the smallest output of any month this year, the production having aggregated only 434,328 tons. The total for the first four months was only 1,950,687 tons, or at the rate of less than 6,000,000 tons annually. The foregoing pig iron statistics exclude Luxemburg and Lorraine, but include estimates for the Saar and the Bavarian Palatinate. During this same period the steel production of Germany declined to 2,165,714 tons or at the yearly rate of approximately 6,500,000 tons. The monthly German production in metric tons in 1919 follows:

	Tons
January	574,191
February	529,913
March	634,893
April	426,717
Total four months	2,165,714

The members of a British commission, who recently visited Germany reported that the workmen at the blast furnaces and steel works are able to work at only one-half of their capacity due to lack of nourishment, and strikes also have shut down many plants. Monthly averages of German pig iron production, in metric tons including the first four months of 1919, follow:

	1913	1,527,000
	1918	1,239,000
Jan.,	1919	501,208
Feb.,	1919	469,209
March,	1919	545,939
April,	1919	434,328

The foregoing figures indicate that the cost of the war to Germany has been approximately 1,000,000 tons of iron monthly or at the rate of 12,000,000 tons annually. It is conceded,

by both British and French ironmasters that Germany's output today is at its lowest mark and that with the signing of peace and the distribution of food among its workmen, that the monthly production will increase at least 50 per cent.

Although the blast furnaces and the steel works of the United Kingdom apparently are operating at capacity, production during the first four months of this year shows a sharp decline as compared with last year. In 1918 the British pig iron output aggregated 9,066,000 tons, but during the first four months of this year production has been at the annual rate of 7,788,000 tons. Steel production likewise has fallen off. In 1918 the British steel plans made a total of 9,591,000 tons, whereas the present rate of production is 8,034,000 tons annually. Last year an average weekly output of 200,000 tons was aimed at, but notwithstanding the large increases in capacity that became operative in 1918, the production thus far this year shows a decline of nearly 20 per cent. The following figures give the average monthly pig iron and steel production of the United Kingdom:

		PIG IRON	STEEL
	1913	639,000	638,600
	1918	799,000	799,000
Jan.,	1919	744,000	771,000
Feb.,	1919	626,000	734,000
March,	1919	624,000	697,000
April,	1919	603,000	617,000

Investigation into the cause of the sharp decline in British iron and steel production this year indicates that it is not due to a falling off in demand, but must be assigned to a shortage of labor. Early in March the iron and steel industry of the United Kingdom adopted the 8-hour day and the plants now are being operated three instead of two shifts. This change involved the employment of an additional working force of 50 per cent. The skilled men, however, were not available and many blast furnaces, steel works and rolling mills are compelled to operate short-handed. To this shortage of labor the decline in production is attributed. The falling off in pig iron output occurred in February and the April output showed a decrease of 141,000 tons as compared with January. In 1913, Germany, the United Kingdom, France and Belgium produced approximately 34,500,000 tons of pig iron. This total includes the record figures of all of these countries except the United Kingdom. However, the production of the latter at present is about at the same rate as in 1913. In arriving at figures showing the approximate production of these countries today, it is unfortunate that statistics of iron manufacture in Silesia and Luxemburg are not available. With a liberal allowance for the production of these districts and deducting the possible output of the destroyed stacks in France and Belgium it is estimated that the present rate of production of these countries is not in excess of 22,500,000 tons annually, a loss of 12,000,000 tons per year. The steel production of these countries in 1913 was approximately 33,776,000 tons and while sufficient statistics are not available to make as good an estimate of the present annual rate of output as for pig iron, deducting losses in capacity in France and Belgium and shrinkages in Germany, it is roughly estimated that the steel output as compared with 1913 has declined nearly 12,000,000 tons annually.

If the reduced production indicated in the foregoing is sufficient for the normal and reconstruction needs of the European nations, with the aid of such neutrals as Sweden and Spain, then iron and steel exports from the United States to continental Europe will not be a factor worthy of much consideration. Great Britain, in view of her proximity to these countries and because of her low freight rates will have the first call for material, notwithstanding the high prices now prevailing as compared with those quoted in the United States. To become real factors in the competition for continental iron and steel needs involves sharp reduction in ocean freight rates, but the indications are that these will not be made in the immediate future. However, the European situation insures to the iron and steel manufacturers of the United States a long period of trade activity in the export markets in the remainder of the world in which Great Britain will be the most formidable competitor, to be followed at a distant date by France and Belgium.

In the May 15 issue of THE IRON TRADE REVIEW, page 1300, reference was made to the negotiations that are under way between English and American iron and steel manufacturers with a view to securing greater unanimity of action in the world's iron and steel export trade. The plan is still being discussed although no definite arrangements have yet been entered into. The cast-iron pipe manufacturers of the United States and England similarly have opened negotiations whereby it has been suggested that the pipemakers in the United States serve primarily the needs of the Latin-American countries and the remainder of the trade long held by the English makers be continued to be reserved to them.

The provisions of the Webb-Pomerene act are particularly pleasing to British iron and steel manufacturers, which permits of the operation of the Consolidated Steel Export Co. and other similar corporations of American competitors in the export trade of the world. It has been suggested that legislation be enacted that will permit of the organization of similar corporations in England. The French Comptoir Siderurgique has just organized a special export branch of the Comptoir which deals with domestic and export trade in semifinished materials, rails, shapes, plates, etc. French manufacturers have been approached by the emissaries from the United States relative to an understanding covering the world's export trade and while for the present at least the French iron and steel manufacturers will hardly figure as large factors in the export trade, nevertheless their competition within five years will be worthy of consideration.

Whether the British government will view favorably the enactment of a measure similar to the Webb-Pomerene act, in view of its recent investigation of trade associations and combinations, seems problematical. In February, 1918, the minister of reconstruction appointed a committee on trusts which has just submitted a

(*Concluded on Page 1713*)

British Prices Far Above American Market

Quotations f.o.b. Works, United Kingdom and Pittsburgh as of June 5

Material	Shillings	Dollar equivalent at $4.62 rate of exchange	Quotation equivalent material, f.o.b., Pittsburgh	Excess in prices England over the United States
Cleveland foundry pig iron, No. 3	160	$36.96	$27.65	$9.31
Bessemer iron	184	42.40	29.35	13.05
Basic iron	170	39.27	27.15	12.12
Soft steel billets	290	66.99	38.50	28.49
Sheet bars	270	60.37	42.00	18.37
Angles	330	76.23	54.88	21.35
Tees	350	80.85	54.88	25.97
Beams	330	76.23	54.88	21.35
Welsh tin plate, per box	33	7.62	7.00	0.62
Furnace coke, Nottingham and Cardiff	42	10.70	4.00	6.70
Foundry coke, Cardiff	55½	12.82	4.75	8.07
Heavy steel scrap, Middlesborough	150	34.65	16.00	18.65

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

AT the annual meeting of the stockholders and board of directors of the Bon Air Coal & Iron Corp., Bon Air, Tenn., the following officers were re-elected: President, James R. Oldfield; vice president, William J. Cummings; chairman of the board, William Wrigley Jr.; treasurer, John McE. Bowman; secretary, Fred Leach; general superintendent, Harry Anderson; assistant treasurer and general auditor, John O. Swingley; superintendent of the iron division, John E. Dowd; chief engineer, Allison Welch; purchasing agent for commissaries, John D. Cummings, and purchasing agent for supplies and material, Stephen Lenehan. The board's chairman, William Wrigley Jr., is the Chicago chewing gum manufacturer. Col. Jacob Ruppert, large New York realty and brewery owner. President James R. Oldfield is son-in-law of Chairman Wrigley. Other members of the board are: John McE. Bowman, of the Bowman Hotel Corp., New York; Edwin C. Goshorn, of the National Lead Co., Cincinnati; F. B. Hitchcock, F. B. Hichcock Co., stock and bond brokers, Chicago; and William J. Cummings, vice president of the Bon Air company.

* * *

THE Peakmet Metal Co. has been organized at Landsdale, Pa., by Philadelphia interests to produce composition metal for high pressure valve pump fittings, etc. A site has been purchased at Landsdale by the company for the erection of a plant.

* * *

AGREEMENTS have been signed by the Productions Castings Co., Detroit, whereby it acquires the casting plant of the Ann Arbor Machine Co., at Ann Arbor, Mich. The new company will manufacture gray castings for autos.

* * *

INCORPORATED at $1,000,000, the Hart & Cooley Co., Inc., New Britain, Conn., is to make furnace regulators, floor registers and grill ventilators. It succeeds the Hart & Cooley Co., organized in April, 1901, with $400,000 capital, of which H. S. Hart was president and N. P. Cooley treasurer. Although the new company will start business with $500,000 capital, the directors are authorized to issue $1,000,000 worth of stock. The directors of the new company are E. H. Cooper, George P. Hart, Norman P. Cooley, Howard S. Hart, James T. Robinson, Edward N. Stanley, R. C. Twitchell and E. C. Goodwin.

* * *

THE W. E. Caldwell Co., Louisville, Ky., manufacturer of towers tubs and tanks, associated with J. B. Crawford, an experienced saw mill man, will build a 30,000 to 35,000 cut band saw mill in St. Landry parish, La., where the company owns large tracts of cypress, ash, oak and gum timber.

* * *

CONTRACTS for 250 tons and 350 tons respectively of its grip bars have been taken by the Paul J. Kalman Co., St. Paul and Chicago. The former tonnage is for use on the new St. Paul union station, being erected by the George J. Grant Construction Co., and Morris, Shepard & Dougherty, that city. The latter is to be used in the construction of the Des Plaines river sewage treatment plant, Maywood, Ill., for which the Leyden-Ortseifen Co., Chicago, has the contract.

* * *

WITH a capital of $3,000,000, $2,000,000 in common and $1,000,000 in preferred stock, the organization of the Newton Steel Co., Newton Falls, O., was completed at Youngstown on June 18. Directors were elected as follows: Edward F. Clark, John W. Ford, Harold A. Taylor, J. H. Fitch, W. H. B. Ward, H. M. Steele and George T. Fillius. The board named the following officers: President, Edward F. Clark; vice president and general manager, H. M. Steele; and secretary and treasurer, J. H. Fitch.

* * *

FULLY equipped with modern appliances, the J. Lipsitz Co., 289 Third street, Chelsea, Mass., has started an 8-acre scrap iron yard on the Pittsburgh & Reading railroad tracks in Lebanon, Pa. This yard formerly was operated by the Joseph Joseph & Bros. Co., and the J. Lipsitz company is installing shears, locomotive crane with lifting magnet, railroad track scales, etc. It will be operated in conjunction with the company's yard and office at Chelsea and with its New York office, located in the Woolworth building.

* * *

HEREAFTER, when a new crane is ordered by the Cambria Steel Co., Johnstown, Pa., preliminary drawings must be submitted to the operating department which will maintain the crane and a list of necessary spare parts must be made out at once. These spare parts will be ordered and delivered with the new crane. In this way the spare parts could be prepared cheaper and would be available from the first day of operation, thus eliminating the possibility of shutdown due to the lack of parts. This suggestion recently was accepted by the Cambria Steel Co., which awarded the sponsor a prize of $10 for the suggestion.

* * *

THOMAS F. COLE and Richard M. Sellwood, prominent financiers in mining on the Lake Superior ranges, are leading stockholders of the Zenith Iron Mining Co., recently incorporated at Duluth. Of the new company, which is a $1,000,000 corporation, R. B. Whiteside is president, Mr. Cole vice president and Mr. Sellwood secretary and treasurer.

The company will operate initially the Zenith mine on the Vermillion range at Ely, Minn., which until the end of 1918 had been operated by the Oliver Iron Mining Co., Duluth, a Steel corporation subsidiary. The lease of the mine to the new company is declared to run for a period of 50 years, the royalty is to be based upon the price of ore at Lake Erie ports. It will represent, according to reports, about 20 per cent of the selling price of the ore. Royalties will be payable this year on such amount of ore as is mined. In 1920, royalties will be upon a minimum of 200,000 tons and for each year thereafter upon 300,000 tons.

The Zenith mine produces a high grade ore of which there is declared to be 1,000,000 tons in sight. The surface plant now owned by the Oliver Iron Mining Co., will, it is reported, be taken over by the new company.

Expect Great Ore Shipments Soon

Minnesota Mining Companies Sanguine of Steady Improvement in Operators—Steel Corporation May Bring Down as Much Ore as in 1918—Scarcity of Miners Reported—Zenith Mine Taken Over by New Owners

(Special Correspondence)

DULUTH, June 21.—Steady improvement in operation of ore properties on the Minnesota ranges is expected. Operators are sanguine that good orders from eastern furnaces will be received, and that shipments from the head of the lakes will tax the capacities of the carriers after July 1. June ore shipments will make a better showing than those of May, and after midsummer the docks may be operating at full capacity.

The Oliver Iron Mining Co. continues to set the lead in mining operations. Approximately 13,000 men are now employed by the company in the Lake Superior district. Officials say they would increase the force at some of their mines provided experienced miners could be obtained. Although wages of contract miners are averaging $6.50 and $7 a day, mine superintendents report the supply of men is far below demand.

The big open-pit mines of the Oliver company in the Hibbing district have increased their shipments to about 80,000 tons a day, and it is predicted that the season's shipments from the Oliver properties in that district will almost if not equal those of last year when total shipments amounted to 10,000,000 tons.

The Tod-Stambaugh Co. is making fairly heavy shipments from the Dean, Dunwoody, North Eddy and Warren mines. Also, in the Hibbing district, the Wisconsin Steel Co. is making progress in removing the overburden from the Sargent property. That mine is of the underground and open-pit type and is equipped with the most modern machinery.

Active operations are reported in the Canisteo district, near Coleraine, Minn. Pickands, Mather Co., the largest operators in that district, have completed the erection of a large single-unit concentrating plant near Taconite. The Cleveland Cliffs Iron Co., is making considerable progress in that district with mines and ore lands leased from the Great Northern interests. The company has purchased homes for its employes at Marble, where its headquarters for the Canisteo district will be located.

Although operations on the Cuyuna range have been slow so far owing to the lack of demand for manganiferous ores, in consequence of the low ebb of operations at steel plants, owners of those properties are looking forward to a fair volume of business before the season is over. It is believed that liberal quantities of these ores will be wanted for alloys as soon as operations are speeded up. W. H. Locker, vice president of the American Manganese Mfg. Co., which owns the Cuyuna-Duluth and the Cuyuna Mille-Lacs mines expects to start work soon at the former mine. So far this season 40,000 of the 60,000 tons of ore on the Cuyuna-Duluth stock pile have been shipped out.

The Ida Mae mine, a Cuyuna-range, manganiferous property, has been taken over from the Minneapolis Cuyuna Iron Co., by a Pittsburgh syndicate headed by W. H. Fetzer. That property entered the shipping list last season and it is thought to have a good tonnage of ore in sight.

New Company to Operate Mine

A recent development on the Vermilion range was the organization of the Zenith Iron Mining Co. to operate the Zenith mine near Ely, Minn. That property was operated by the Oliver Iron Mining Co. until last season. It was acquired by the United States Steel Corp. through taking control of the Minnesota Steel Co., which then held the entire Ely group. The property was held under a lease that expired in the spring of 1918. The lease provided for a royalty of 30 cents a ton. The fee owners extended the lease to the Oliver company for another year at a royalty of 85 cents. As the Oliver interests and the fee owners could not agree upon the terms for a new lease, a new company was formed with R. B. Whiteside of Duluth, president; J. F. Cole, of New York, vice president, and R. M. Sellwood, of Duluth, treasurer. The company was organized with a capital stock of $500,000 to work the mine independently. The royalty to be paid the fee owners will be based on 20 per cent of the value of the ore at the Lake Erie docks. The mine produces a good grade of bessemer ore. It is estimated that there is now 1,000,000 tons of ore available for shipment, and it is understood that shipments will be made from the mine this season.

Everything is running smoothly at docks at the head of the lakes, and with the big new dock of the Duluth, Missabe & Northern railroad in operation facilities for unloading and loading ore during the fall rush period will be better than ever. A record for quick loading was established recently at that dock when the steamer REAM of the Pittsburgh Steamship Co.'s line took on a full cargo in two hours and 15 minutes.

The Draper, a state-owned mine, located two miles northeast of Calumet, Minn., and operated by John A. Savage & Co., is preparing to make its first shipment. A washing plant has been built at the property to treat the bulk of the ore. The Savage interests also are operating the Croft mine on the Cuyuna range, and they are developing the Sagamore mine, a manganiferous property on that range, give promise of producing a large tonnage.

In view of the improved situation in the steel trade the Shenango Furnace Co. has increased the shipments from its Mesabi range mines. A month ago the production at its Shenango mine was curtailed. E. J. Maney, manager of the company's mines department, on returning from the east, expressed himself in optimistic terms regarding the industrial outlook for the balance of the season.

The Minnesota Steel Co., is preparing for increased production of semifinished steel at its plant in Duluth as soon as conditions warrant. The company has engaged about 300 more men during the last 10 days, and is making repairs and improvements.

Mining men here are interested in the outcome of a case just decided in the district court at Duluth. John A. Savage & Co. were awarded a verdict of $2375, their full counterclaim in a suit entered against them by C. A. Remington, of Hibbing, Minn., to recover $61,000 for specific performance of contract in the purchase of a stockpile. In their answer to the suit, John A. Savage & Co. claimed that the percentage of silica in the ore was found to greatly exceed the limit allowed in the contract, and they refused to carry it through. They claimed $2375 to cover the depreciation in the value of the ore taken by them from the stockpile, winning out on all points. The verdict is regarded as important in setting a precedent that sellers of ore must live up to their representations regarding values and the precentages of impurities carried in it.

A. S. M. E. Branching into New Fields

Spring Meeting at Detroit Favors Broadening Activities of Society Along Conservative Lines—Proposed Publishing Plans Not Favored—Research to be Fostered—Progressive Ideas on Industrial Relations

ON problems of capital and labor, industrial reconstruction, the more effective application of science to industry through properly directed research, and the future status of the engineering profession, with special reference to its relation to present-day economic and political developments, were focussed the efforts of 1180 members and guests of the American Society of Mechanical Engineers at the spring meeting which took place in Detroit from Monday to Thursday of last week. As indicated in the preliminary reports of the first two days' proceedings published in the June 19 issue of THE IRON TRADE REVIEW, the spirit of unrest which is now manifesting itself in various forms throughout the world has not left the engineering profession untouched and its ebullitions were evident throughout the week at Detroit. As a result, sharp differences of opinion were expressed at practically every session, whether the discussions were technical, general or concerned with the society's own affairs.

The growing unwillingness of the membership to follow prepared paths without investigation, or to rubber-stamp official action without inquiry was specially in evidence in the reception accorded the exhaustive report of the committee on aims and organization. Acting on behalf of the society, this committee made a courageous effort to grapple once for all with the many fundamental problems connected with the future status of engineering and the conduct of the affairs of the A. S. M. E. While the report was subjected to 12 hours' debate, and was not received wholly with open arms, its main progressive principles were accepted by the meeting.

As a result of these deliberations the society hereafter will elect its officers by a new method intended to be more democratic, it will back up its engineering standards with the full weight of its authority, it will revise its code of ethics with the idea of putting teeth in it, and also more effort will be devoted to research work and to national co-operation among engineers.

Speakers at the various sessions took advanced stands on the labor problem and on the question of scientific research. The square deal formed the keynote of the industrial relations session, which was more heavily attended than any other. Tangible progress toward getting results from applied science was made at the two research sessions while at the remaining technical sessions many engineering problems were discussed. The entertainment program provided by the Detroit local committee was unusually enjoyable and many prominent plants in the vicinity were inspected.

Committee Report Debated and Amended

WHEN the deliberations on the report of the committee on aims and organization were finally concluded Wednesday noon, the report went to the council considerably amended although intact in its essential features and backed by an unprecedented amount of debate and testimony. It was pointed out at the outset by Calvin W. Rice, secretary, that the resolutions in the committee's report are not mandatory on the council but simply advisory and that the debate should be considered only as an expression of the opinion of the members present at the meeting. The attendance, however, was not only unusually large, but representative in character, both geographically and otherwise, and the report of the committee coupled with the discussions undoubtedly will have much weight with the society's leaders.

As pointed out in the June 19 issue, the committee's report contained 25 resolutions and recommendations. Seventeen were accepted without amendment; some of the others were considerably altered. To recapitulate, the resolutions as adopted provide for the following changes in the society's activities: The amendment of the constitution so the society may formally adopt professional reports and standards instead of taking a passive attitude; the abolition of continuous tenure on the subcommittees on program and meetings, substituting short terms; increasing the appropriations for research and expenditure of more money and effort on research and engineering standards; placing industrial engineering on a par with other major technical subjects considered by the society; extending the educational work of the society for the consideration of problems below the grade of college work; the formation of more professional sections within the society; the broadening of the scope of the society's publications; the automatic termination of membership on committees due to absence or neglect, either willful or due to force of circumstances; the extension of the activities of the Engineering Societies' Employment bureau; the revision of the code of ethics of the society; the broadening of the society's co-operative activities in connection with national and local organizations embracing all branches of engineering; and the provision of a means of electing members to the nominating committee by geographical sections.

The debate on the committee's recom-

mendations centered around three principal points, namely the proposals regarding the society's publications, the organization of a national general engineering society, and the method of electing officers.

Committee Reversed

Some of the details of the publication matter were presented in last week's issue. Three resolutions were brought in providing respectively for the publication of *Mechanical Engineering*, the journal of the society, "weekly at the earliest possible date;" for an investigation by the committee on publications of the possibility of reducing the cost of publishing the transactions, presenting any plant developed to the members for letter ballot; and for the publication, as soon as practicable, of a handbook of mechanical engineering data. The proposal to publish *Mechanical Engineering* weekly was stricken out after considerable debate, and the resolution regarding the method of publishing the transactions was amended to provide for a report at the annual meeting.

L. P. Alfred acted as floor leader for the committee. The resolutions regarding publications were presented by G. K. Parsons, consulting engineer, 29 Pine street, New York. Arguments for the amendment of the resolutions were advanced by F. E. Cardullo, engineer of tests, Curtis Aeroplane & Motor Corp., Buffalo; W. E. Symonds, consulting engineer, Galena Signal Oil Co., New York; R. T. Kent, consulting engineer, 299 Broadway, New York; and Alex Dow, president, Detroit-Edison Co., Detroit.

The resolution to make industrial engineering a major subject for the consideration of the society was presented by Walter B. Snow, Boston. Some discussion of the scope of industrial engineering took place in the course of which R. T. Kent presented the following definition: "Industrial engineering is the application and use of the materail and machines of engineering to use in the industries, including problems of management and labor."

The resolutions regarding the relation of the mechanical engineer to the community were proposed by the committee in the following form:

Resolved, That the council of the sosociety should actively encourage further development of co-operation both in local organizations under the leadership of local engineering societies as in Philadelphia or Cleveland, and in state or territorial groups, which can effectively handle state or territorial problems, as in Minnesota or Ohio. This co-operation to take such form as will most readily lend itself to national co-operation and be it

Resolved, That there should be created some agency of a national character through which the co-operation of local groups, state groups and national societies can be secured for purposes of national scope. This agency to be composed of representatives of the members of local groups, state groups and national societies. It should be an independent organization, fully empowered to act and capable of speaking in the name of the profession, and be it

Resolved, That the American Society of Mechanical Engineers should collect and publish in pamphlet form the various modes of co-operative organizations contemplating co-operation, to more readily select the method best adapted to local conditions.

As approved, the proper names, Philadelphia, Cleveland, etc., in the first resolution were omitted and the words "independent" and "fully empowered to act and" in the second resolution were struck out. These resolutions were proposed by C. E. Lord, general patent attorney, International Harvester Co., Chicago.

The opponents of the resolutions as presented by the committee were led by Alex Dow, president, Detroit Edison Co. They declared a super engineering society was projected which smacked of trade unionism and would unduly hamper the liberties of the individual. It also was pointed out vigorously that the proper place for engineers to participate in public affairs is in the communities in which they live through the means of their community engineering organizations.

The discussions of the committee's proposals regarding the method of electing officers on Wednesday morning was participated in by H. P. Porter, superintendent, Gypsy Oil Co., Tulsa, Okla., A. E. Walden, chief engineer, Baltimore County Water & Electric Co., Baltimore, Md.; Robert Sibley, San Francisco; C. R. Richards, deal, College of Engineering, University of Illinois; John L. Henning, consulting engineer, Lake Charles, Ind.; John Hinchey, Buffalo Forge Co., Atlanta, Ga.; and D. Robert Yarnall, Yarnall-Waring Co., Philadelphia. The proposal of the committee was objected to on the ground that it would give undue preponderance to western and southern local sections where membership is scattered. No definite decision was reached and it was decided to instruct the committee to revise its resolutions in light of the debate which took place at the meeting and then refer the matter to the council.

Nominees for Office

PRESIDENT
Fred J. Miller
Consulting Engineer
Centerbridge, Pa.

VICE PRESIDENTS
Prof. Robert H. Fernald
University of Pennsylvania
Philadelphia
Edward C. Jones
Chemical Engineer, Pacific Gas & Electric Co.
San Francisco
Prof. J. R. Alden
Director, Research Department
American Society of Heating and Ventilating Engineers
Pittsburgh

MANAGERS
(*3-year term*)
Prof. Dexter S. Kimball
Cornell University
Ithaca, N. Y.
Earl F. Scott
Earl F. Scott & Co.
Atlanta, Ga.
Elbert C. Fisher
Wickes Boiler Co.
Saginaw, Mich.
(*1-year term*)
Charles E. Lord
International Harvester Co.
Chicago

TREASURER
W. P. Wiley
President, John Wiley & Sons, Inc.
New York

Straight Talk on Labor Problems

THE broadening interests of engineers was clearly manifested by the unusually large attendance at the session on industrial relations Tuesday afternoon. This session was presided over in part by President Cooley and in part by Past President Charles T. Main. The principal paper was presented by L. P. Alford, chief of staff, *Industrial Management*, New York. Mr. Alford's paper deals with the status of industrial relations; a liberal abstract of it appears on pages 1620 and 1621 of the June 19 issue of THE IRON TRADE REVIEW. This paper was followed by a masterly address by Arthur H. Young, manager of industrial relations of the International Harvester Co., Chicago, in which he came out strongly in favor of collective bargaining, along the lines developed by the Harvester company. He said also that the best representatives from the company's standpoint, among the various employes on the works councils dealing with labor conditions are union men. In addition, he stated that the Wisconsin Steel Co., a Harvester subsidiary, is wholly satisfied with the 8-hour actual day as contrasted with the old schedule. Referring to bolshevism, Mr. Young said he has no fear of the sane conduct of foreign-born workmen if properly led and squarely treated. He cited figures showing slightly more enlistments among Harvester employes during the war by foreigners than native Amer-

icans, the proportions being 22 and 20 per cent respectively. Enlistments by the Poles were 30 per cent. Workmen, he said, do not care for profit-sharing plans preferring to get their returns in their pay envelopes. The solution of the problem of industrial relations does not rest with engineers, Mr. Young declared.

He painted in vivid colors the success of the Harvester company's plan for dealing with labor by means of industrial councils on which the management and employes are equally represented. The employes' representatives are elected by a secret ballot, 97 per cent of the employes participating.

Dr. Otto P. Geier, Cincinnati Milling Machine Co., Cincinnati, made an address on the function of the industrial physician. The health factor in industry, he pointed out, is seven times as important as the accident factor. Looking at modern manufacturing from the broad standpoint of public welfare, Dr. Geier said he believes that in spite of the introduction of automatic machinery into many plants and processes, there is still altogether too much sweat in industry.

Fred J. Miller, nominee for president of the society, pointed out that schemes for giving employes a voice in labor matters will fail unless the men are accorded the absolute right to choose their own representatives regardless of the affiliations of those representatives, especially with respect to their membership in unions.

Boyd Fisher, Aluminum Castings Co., Detroit, said that some labor unions are beginning to appreciate the principles of scientific management and that he has found it can be introduced with union co-operation provided the workmen are assured of a square deal. Mr. Fisher also said there is nothing inherent in the policies of labor which lead to the restriction of output.

Richard A. Feiss, general manager, The Joseph & Feiss Co., Cleveland, said that in view of the fact that output of a machine cannot be separated from that of the man who operates it, the problem of industrial relations is essentially and primarily an engineering problem. He took issue with Mr. Young on this point.

Research Work Makes Giant Strides

So much interest was displayed in the question of research work that an entire day was devoted to this subject. President Cooley, in introducing the research sessions, pointed out that we have progressed heretofore by the hit-or-miss method rather than by the logical investigation of the truth, as should be the case in a fully developed nation. A paper on the present condition of research in the United States was presented by Professor Arthur M. Greene Jr., Rensselaer Polytechnic institute, Troy, N. Y. This paper was published in abstract in last week's issue. The plans of the National Research council were presented in papers by G. H. Clevenger and H. E. Howe, Washington, D. C. Mr. Clevenger pointed out how the National Research council, born of war and based on Civil war precedents, is now planning to become a permanent organization with sections devoted specially to metallurgy, mechanical engineering, chemical research, etc. Particular attention is to be paid to the study of the fatigue of metals. Mr. Howe suggested the formation of a series of research associations to investigate such subjects as alloys, metal cutting, refractories, etc. He pointed out that in Great Britain there are 30 such associations confined, however, solely to producers. The plans of the National Research council involve the enlistment of consumers as well as producers in this work.

Dean C. R. Richards of the University of Illinois, traced the growth of the experiment station of the university, which now expends $50,000 a year on research. He pointed out the advantage of having an impartial state institution perform work of this character and made a strong plea for greater publicity in connection with research in order that it may have maximum industrial value. He referred specially to investigations now being made on coking coals by Professor S. W. Parr, which may result in a revolution in coking processes. The work of the Purdue experiment station was described by Dean Charles L. Benjamin of Purdue university.

Blue Heat Treatment

Dr. Zay Jeffries, Aluminum Castings Co., Cleveland, told of the possibilities being opened up by experiments on the treatment of steel at a blue heat, much below the customary temperatures. Shell-steel bars tested by the Youngstown Sheet & Tube Co., Youngstown, O., he said, showed almost double their original ductility after being allowed to season for two weeks, as compared from bars turned from "new" steel. The same increase in elasticity, however, it was found, can be secured in 24 hours by heating the bars for that period at 120 degrees Cent.

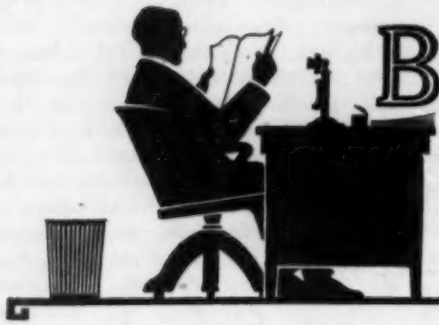
H. S. Coleman, assistant director, Mellon Institute of Industrial Research, Pittsburgh, explained the industrial fellowship system of this organization previously described in The Iron Trade Review. At the present time, Mellon institute is maintaining 44 fellowships and 76 industrial fellows. This work is participated in by seven associations representing about 2700 constituent companies.

At the second session on Wednesday morning, the following papers were presented: "Central Station Heating," by J. H. Walker; "Production of Liberty Motor Parts at the Ford Plant," by W. F. Verner; "Fire Engines," by C. H. Fox; and "An Electrical Device for Measuring the Flow of Fluids in Pipes," by J. M. Spitzglass. Mr. Verner's paper was published on pages 1624-1626 of the June 19 issue of The Iron Trade Review.

At the fuel session, Thursday morning, two papers on pulverized coal were presented by N. C. Harrison and Frederick A. Scheffler and H. G. Barnhurst, respectively. Mr. Harrison's paper was published in last week's issue.

Edwin Lundgren, chief engineer, stoker department, Westinghouse Electric & Mfg. Co., East Pittsburgh, pointed out that the Detroit central station obtains a boiler efficiency of 80 per cent by means of automatic stokers and said that in his opinion pulverized coal is chiefly valuable for burning inferior fuels or as industrial aid in times of shortage. W. O. Witherspoon, Miami Copper Co., Miami, Ariz., told of the use of powdered coal in South Africa in units of 1000 horsepower. The overall efficiency, he said, is satisfactory, although the quality of the coal is exceedingly poor, the heating value being as low as 9000 British thermal units per pound. The coal, however, costs only about 25 cents a ton at the mine to which is added a freight charge of approximately $1.50 a ton. Boilers of the Beddington type are used. Mr. Witherspoon also said that a screw feed is not necessarily an essential part of a pulverized coal burning equipment. He described an installation in Canada where the coal is delivered through a long pipe line at the rate of 2½ tons in 5 minutes by an air pressure of 70 pounds per square inch which is placed behind the solid coal and not mixed with it.

Little Stories of Business Life



Raising the Roof

BECAUSE the Cleveland Cliffs Iron Co. required more space for its offices in the Rockefeller building, Cleveland, it negotiated with the owner, John D. Rockefeller Jr., to see what could be done. He took the matter up with the J. A. Rutherford Co., which promised to splice in an additional story in the northwest wing of the building by Aug. 1. The G. Alexander & Son Co. was engaged to prepare the building for the splice. The wing, 45 x 100 feet, had to be split at the window line and the entire tenth story was lifted with the roof several feet at the rate of a fraction of an inch at one time. Thirty-five men did the lifting with as many jacks, each man at a given signal from the foreman giving his jack a specified twist, so that the entire mass was raised at the same rate.

While the lifting work was in progress, tenants of the tenth floor were not disturbed and no function of any part of the building was interfered with. Steel columns of the building frame were spliced in inch by inch and special pipes for hot and cold water for the heating system were installed in the form of sliding joints. As the lifting process progressed, the pipes automatically lengthened. The job is expected to cost about $30,000 and will make the northwest wing 11 stories high instead of 10.

Not Intentional

LOUIS H. WILLIARD, of the Washington office of the Carnegie Steel Co., recently had occasion to apply to the government printing office for a copy of the congressional directory. When he opened the package sent him he found a volume of "Diseases of Horses."

Thoroughly American

PRINCIPLES underlying the organization and operation of the All-American Truck Co., Chicago, which is just starting the construction of a truck manufacturing plant, are a reflection of a deep-seated sentiment that is fairly widespread since the war. This company will employ only American citizens, will use only parts manufactured in America and the dealer organization will contain only American citizens. Nothing of foreign origin will enter into or come in contact with the trucks at any stage and the product will be what the company's name indicates—all-American.

Bolshevik Fluorspar

FLUOSPAR evidently can be made to have a dangerous appearance. Recently a sample of this mineral was sent from New Mexico to the office of Henry Clews & Co., 15 Broad street, New York. It was put up in a cylindrical package, 7 x 3 inches, and when found in the mail by G. Bleilevens, assistant cashier for Henry Clews & Co., at first was believed to be a bomb. Mr. Bleilevens took the package to a police station where it was opened by a member of the staff of New York's bureau of combustibles. The cylinder was found to be filled with a greenish-blue stone, along with which was a piece of paper on which was typewritten, "Sample of high-grade fluorspar ore, from J. H. Cauthen, Lampasas, Tex., from Great Eagle mine, Grande county, N. M."

The Iron Horse

A NEW line of manufacture in the iron and steel world that should absorb an increasing quantity of material has encountered a snag which has given a temporary setback which it is hoped will be overcome without serious delay. It comes about through the inertia of human nature and its lack of ready adaptability of new ideas and methods. With the farm tractor perfected and adapted to common use, offering the farmer a substitute for horsepower it was believed farm production had been given an adjunct that would be of extreme value. In the hands of the more progressive this has proved true but on the average it has failed to meet expectations. It is not the fault of the tractor as much as of the user. A farmer, bred for generations to care for horses, to feed and curry them, bed them down at night, treat their illnesses and see that they are properly exercised, buys a tractor and seems to feel that it needs no attention. He shuts it off at the end of the day's work and leaves it until the next day where it may be standing, starting again the next day. Naturally it soon balks and makes trouble. With half the time necessary to keep a team of horses in condition the tractor would be in a high state of efficiency, but this fact has not been learned by the average user. Even his experience with the engine of his automobile has not taught him. But this will come with experience and education and the place of the tractor will be made secure.

War Remakes Steel Map

(*Continued from Page* 1706)

report on the result of its investigations of all kinds of trade associations. Practically every branch of the British iron and steel industry is represented by some association and in referring to these organizations the report states that "nearly all of these are definitely known or believed to be engaged in regulating prices and output." The list of some of the associations in the British iron and steel industry contained in this report, follow:

PIG IRON

Cleveland Pig Iron association, 17 firms.

Scottish Ironmasters' association, 12 firms.

South Staffordshire Ironmasters' association.

West Coast Iron committee, 7 firms.

Ferromanganese and Spiegel association, 5 firms.

STEEL

Scottish Steel Makers' association, 7 firms.

Northeast Coast Steel Makers' association, 10 firms.

South Wales Siemens' Steel association, 8 firms.

ROLLED PRODUCTS

British Joist Makers' association, 9 firms.

British Rail Makers' association, 16 firms.

Midland Steel Angle Makers' association, 6 firms.

Small Steel Bar association, 8 firms.

Sheet Makers' conference, 31 firms.

Rod Rollers' association, 11 firms.

Welsh Plate and Sheet Makers' association.

STEEL CASTINGS

Steel Castings Manufacturers' association, 20 firms.

IRON CASTINGS

Cast Iron Holloware Makers' association.

British Cast Iron Pipe Founders' association.

National Light Castings association.

FORGINGS

English and Scottish Forgemasters' association, 18 firms.

Federated Forgemasters, 13 firms.

Midland Forgemasters' association.

BAR IRON

Lancashire Bar Iron association.

Scottish Bar Iron Makers' association, 13 firms.

South Yorkshire Bar Iron association, 10 firms.

Northeast Coast Bar Iron association, 5 firms.

MISCELLANEOUS

Iron and Steel Wire Manufacturers' association, 29 firms.

British Tube Makers' association, 32 firms.

Steel Nailmakers' association.

Weldless Steel Tube Makers' association, 7 firms.

Wire Netting association, 10 firms.

Railway Tire and Axle Makers' association, 14 firms.

Railway Wheel and Axle Makers' association, 15 firms.

Steel Rope Wire Makers' association.

Coil Spring Makers' association.

The report states that while this list is not complete, it affords some indication of the extent to which associations pervade the whole iron and steel industry of the United Kingdom. The report continues: "A large proportion of them either are permanently or intermittently price associations, concerning themselves, as a rule, only indirectly with output. In the majority of cases they do not comprise more than a small number of firms, but generally a large proportion of the trade." While the associations enumerated deal largely with raw materials of the intermediate products, many associations also consist of manufacturers of the more finished iron and steel goods. The report also states that the makers of iron castings used for building purposes are grouped in a powerful association embracing 90 per cent of the industry. An association also comprises the whole of the galvanized iron sheet trade and another has enrolled in its membership four-fifths of the makers of metal beds.

The subject of consolidations in the iron and steel trade is covered in the report as follows:

"Besides the association of independent firms, there are in the iron and steel industries an increasing number of great consolidations; some horizontal, as where a number of steel, shipbuilding, bolt and screw, or other firms engaged on the same stage of manufacture have amalgamated; and some vertical, as where firms previously engaged as separate business concerns in coal, pig iron, steel and structural or marine engineering have become fused into one financial interest. It is not definitely known that all those associations regulate output and price, but we are satisfied that as regards many branches of the iron and steel industry, price is only partly determined by competition and is regulated by the manufacturers acting in concert."

The report recommends the organization of a tribunal or commission, perhaps similar to our federal trade commission, which will have authority to investigate the operation of monopolies, trusts and combines.

Boiler Makers

Convene at Buffalo and Discuss Labor and Technical Problems

Buffalo, June 24.—In his annual address at the thirty-first annual convention of the American Boiler Manufacturers association, which convened in Buffalo, June 23, W. C. Connelly, Cleveland, president of the association, said that as long as mechanics are paid high wages, they should return value received in the shape of high efficiency. "Full value sums up America's future and the workingman must give full value. Money paid to men who do not return full value breeds Bolshevism," the speaker declared. While discussing the war labor board, Mr. Connelly said, "The war labor board is a cause of unrest and should be dissolved. While I have all due respect for ministers of the gospel, they should keep their hands out of industrial problems." In this respect, the speaker referred to the recent activities on the part of some clergymen in fostering labor unrest.

Dr. D. S. Jacobus, advisory engineer, Babcock & Wilcox Co., New York, read an interesting paper on increasing boiler-room efficiency. He pointed out that exhaust steam is a source of waste which should be used more extensively for heating purposes. Clean boilers, flues and feed water as well as the education of the fireman along lines of efficiency were advocated. It was pointed out that when a fireman is given arbitrary instructions, the results of which he does not understand, but little good can be accomplished, whereas if he is taught the reasons for the instructions better results are bound to follow. "It is a mistake," said Mr. Jacobus, "to presume that as able a man is not needed in the boiler room as in the engine room." Mr. Jacobus described how waste heat from blast furnaces is efficiently used at present while in times past this source of heat was not considered. "At present," he said, "the utilization of this heat for generating steam is saving 1,000,000 tons of coal annually."

The association also accepted the following standard steam pressures for water-tube boilers: 160, 180, 200, 225, 250, 275 and 300 pounds. For fire-tube boilers of the horizontal return tubular type, exclusive of the Scotch type, the following standards were adopted: 100, 125 and 150 pounds.

Peace Speeds Export Finance Plan

Leading American Financiers Evolving Means by Which Europe May be Saved Economically and American Foreign Trade Maintained—Reserve Board Helps—Bills Planned—Wire Merger Announced—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

WITH peace translated from a hope to a fact important developments in plans for financing the huge volume of exports needed to rehabilitate Europe's war-shaken economic structure, are expected within the near future. For weeks the country's leading financial minds have been studying this great problem of long-term credits which promises to tax the resources of the nation to the utmost. Many suggestions have been offered with the result that a tangible plan gradually is being evolved, although many of the complicated details remain to be successfully worked out.

The plan which apparently has met with the most generous approval is embodied in a tentative bill in the hands of Senator Edge, of New Jersey, who will introduce it as soon as it is in complete form. The measure provides for the organization of a great co-operative corporation capitalized for many hundreds of millions of dollars, and designed to co-ordinate the resources and efforts of the nation's financial, commercial and industrial interests for the purpose of supplying Europe with raw materials, machinery and other requirements essential to the re-establishment of prosperous conditions.

Every manufacturer with export aspirations is vitally interested in the successful working out of the plan of financing, because without it shipments of goods to Europe, except to customers of present good credit standing, would be exceedingly precarious. The people in Europe do not need money. This has been sufficiently emphasized by Mr. Vanderlip, who has done much to awaken the country to an appreciation of the seriousness of conditions abroad. They need most, those things which will enable them to start plants and factories, employ the idle millions and start back on the road to prosperity, after the long strain of existence under war conditions.

Before the financing problem can be worked out in detail the first necessity is for an inventory of the detailed needs of each of the countries, together with credit information, sources of credit enjoyed by the various countries and the extent to which indemnities may be expected to serve as bases for credits. At present the aggregate needs of Europe are vague, they being variously estimated at from $2,000,000,000 to $5,000,000,000 during the next year or two.

In the broad-scope plan for credits now being brought into tangible shape the one point of disagreement is that respecting government participation. One school believes that the government should participate, while another believes it should merely co-operate. Those holding the latter belief, including Secretary Glass, declare that the government had loaned the huge sum of $10,000,000,000 abroad and should not involve itself further but that private initiative should take up the reconstruction task. Private bankers have loaned $2,500,000,000 abroad since the war started, making a total of $12,500,000,000 of American credits extended to Europe.

Those who would have the United States participate in the financing scheme believe it is necessary in order to guarantee loans that are extended to unstable European nations. With the government actively interested it is believed that a league of nations mandate would suffice to compel the liquidation of the credits. It may be possible to have the government sufficiently interest itself to lend its influence in insuring the payment of the loans when due. This is a detail that is yet to be decided.

The bill in its tentative form would provide for the organization of a huge corporation composed of several groups of financial and industrial interests. On the shipment of consignment of American goods to Europe the foreign customers would issue their obligations, guaranteed by their governments, possibly by the national customs, and against these the American financing group would issue indentures to be absorbed in the United States. These debentures would constitute a primary lien upon the foreign obligations and means would have to be found to make them attractive to American investors. The members of each group would be confined to one branch of industry, and the credit problems of the respective industries would be handled by corresponding groups.

It is proposed to allot the stock among the great international banking houses while big exporters like the United States Steel Corp. and the Consolidated Steel Corp. as well as many other interests which are also expected to take stock.

One tangible step has been taken by the federal reserve board which has decided to ask congress to make it possible for national banks to invest not exceeding 5 per cent of their capital and surplus in the stock of corporations engaged in export trade. While the board believes that long-term investments for Europe is an investment rather than a banking problem, it is willing to come to the support of plans for financing export trade. By the adoption of legislation outlined by the board banks would be able to devote $100,000,000 to export credits, and they could participate in trade groups, such as is in process of organization by the cotton interests and designed for all great basic industries by the tentative plan outlined above. It is believed that active participation of the banks would have the effect of encouraging participation by the general public.

New England Merger is Carried Through

Worcester, Mass., June 23.—The Clinton-Wright Wire Co., Worcester, was incorporated in Boston, June 21, with $12,500,000 capital stock to take over the Wright Wire Co., with plants in Worcester and Palmer, Mass., the Morgan Spring Co., and its two subsidiaries, the National Mfg. Co., and the Miller Wire Cloth Co., both of Worcester and the Clinton Wire Cloth Co., with a plant in Clinton, Mass., and an office in Boston. The latter is the oldest wire cloth concern in the United States, having been established in 1856. The capital stock of the company is divided into three classes, $3,500,000 first preferred, $1,500,000 voting preferred and $7,500,000 common. The preferred stock has a par value of $100 and the common stock $50, all of which is practically oversubscribed.

The stockholders will meet this week to organize. Officers already selected include these men who have been identified with the three companies: Chairman of the board of directors, George M. Wright, president of the Wright Wire Co.; president and general manager, Evan F. Jones, treasurer and general manager of the Morgan Spring Co.; vice president and general sales manager, John A. Denholm, assistant treasurer and sales manager of the Wright Wire Co.; vice president and assistant general manager, George F. Wright, assistant general manager of the Wright Wire Co. The treasurer, assistant treasurer, secretary and clerk have not been named, but it is expected they will be officials of the merged companies.

There are to be 11 directors, of which these already have been selected: George M. Wright, Evan F. Jones, John A. Denholm, George F. Wright, George F. Naphen, New York, of Liggett & Drexel, members of the New York stock exchange, who put through the deal, Frank A. Drury, president of the Merchants National bank, Worcester, Paul B. Morgan, president of the Morgan Spring Co., Morgan Construction Co., and the Heald Machine Co., all of Worcester, and Charles F. Fairbanks, Lexington, Mass., president and treasurer of the Clinton Wire Cloth Co. The others will be representatives of large banking interests in New York who are associated with Liggett & Drexel. There will be a finance or executive committee chosen by the directors, of which Mr. Naphen will be chairman. General headquarters will be at the Wright Wire Co., Worcester. The Clinton Wire Cloth Co. will give up its Boston office.

The new company will have $1,500,000 paid in as additional working capital to provide for future extensions, all of which will be made at the Palmer branch plant of the Wright Wire Co. The tonnage of the company will be about 60,000 annually.

The company starts with no funded debt or mortgages and with an excess of $4,000,000 in net quick assets exclusive of plants and machinery. The net earning capacity of the three plants in the merger is placed at about $1,500,000. They have done a gross business of between $12,000,000 and $15,000,000 annually. The Wright Wire Co. consumes in excess of 25,000 tons of wire rods annually, the Morgan Spring Co. close to 20,000 tons and the Clinton Wire Cloth Co. about 12,000.

One of the conditions of the Clinton Wire Cloth Co. going into the merger was that the heads of its important departments should be retained.

Ohio Steel Products Sold to Youngstown Men

A new company headed by Maj. John A. Logan, Youngstown, and Clyde E. T. Tousley, Warren, O., has purchased the stock, site and plant of the Ohio Steel Products Co., Mineral Ridge, O., from A. G. Webb of Cleveland, and L. B. Young, of Mineral Ridge. New machinery is to be installed and extensions will be made as required. Additional land is being purchased to allow for future growth. The present capital of $100,000 is to be increased to $400,000. The following directors have been elected: John A. Logan, C. E. T. Tousley, S. D. L. Jackson, Frank D. Zug and Myron S. Curtis. Mr. Logan has been named as president, and Mr. Tousley, vice president and general manager of sales. The latter has resigned his connection with the Trumbull Steel Co., where he had charge of sales extension. Mr. Logan comes from a well known family in the iron industry. His grandfather, Chauncey Andrews of Youngstown, built and operated the Andrews & Hitchcock Iron Co., for many years. Mr. Andrews also had extensive interests in ore and coal properties and built the Pennsylvania railroad through that part of Ohio. Mr. Logan is a descendant of Gen. John A. Logan of the Civil war and Maj. John A. Logan Jr., of the Spanish-American war. The present John A. Logan served as major in the 37th division and is vice president of the Carbon Limestone Co. Mr. Tousley was a lieutenant in that same division and before the war was affiliated with the Carnegie Steel Co.

The Ohio Steel Products Co. makes tubes, tubular products, special shapes, using cold and hot rolled strip steel. Nearly all its products are used in the automobile industry.

Cleveland Foundries Merge

The Acme-Palmer & DeMooy Foundry Co., Cleveland, a new corporation, will commence to operate July 1 with a capital of $400,000. This represents the merger of the Acme Foundry Co. and the Palmer & DeMooy Foundry Co. For a time operations will be concentrated at the Acme plant which will be enlarged and additional labor-saving machinery installed. The new company will be under the management of W. B. Greene as president and William Greenbaum as secretary and treasurer. It will continue to specialize in the manufacture of light gray iron castings.

Advancing Prices

Shown in Solvent Naphtha and Certain Other Coal Tar Products

New York, June 23.—An advance of about 3 cents has been made in solvent naphtha, the market now holding at 23 to 27 cents. These quotations are on either spot or contract material. Aside from this change, the coal tar products market is largely the same as last week. Pure benzol is holding at 24 to 28 cents and toluol at 25 to 35 cents. Due principally to the continued heavy demand for motor benzol, supplies of these products are scarce, and an advance is expected within the near future. Motor benzol itself is tending upward.

Another factor in the strength of pure benzol is the continued good buying by the rubber industry of 90 per cent benzol. This latter is being held at 23½ to 27 cents. Although the demand for naphthalin is less active, the market is steady at 10½ to 11½ cents in balls, and at 8½ to 9½ cents in flakes.

Some heavy buying in phenol recently has stripped the market of spot material. This situation, however, is not expected to last long. For the present the market on spot may be quoted as nominal. The market on sulphate of ammonia remains dull. The only buying at present is largely for export, and the tonnage is not large. Prices on foreign business continue around $4.85 in double bags at seaboard.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plant

Pure benzol	$0.24 to .28
Toluol	.25 to .35
Solvent naphtha	.23 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.08½ to .09½
Naphthalin, balls	.10½ to .11½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

Contract

Pure benzol	$0.22 to .27
Toluol	.25 to .35
Solvent naphtha	.23 to .27

Per Pound at Producers' Plant

Phenol	$0.10
Naphthalin, flake	0.08½ to .09½
Naphthalin, balls	.10½ to .11½

Per 100 Pounds Producers' Plants

Sulphate of ammonia	nominal

Large Tool Lists Continue Absent

With Fair Sized Inquiries Dealers Transact BusinessPromising Fair Total for Month of June—Dearth of Buying in East in Tools and Cranes—Canada Seeks Tools in United States

WITHOUT large lists, machine tool dealers in different sections of the country are rolling up a fairly satisfactory total of sales. Small lots generally are sought, but occasionally some fair sized propositions similar to the Firestone Steel Products Co. list for Akron, O., still before Cleveland dealers, come up. Several lists comprising five or six tools appeared this week to Chicago, Detroit and Cleveland sellers and building activity in those districts promise the early issuance of additional sizable lists.

Labor troubles continue to hamper machine tool activity in Canada as well as in the United States. It is known that uncertainty regarding labor is holding up manufacturing activity which might necessitate some tool buying in Cleveland. Several Canadian firms need tools immediately and failing to locate them in Canada, are coming to the United States. The White Sewing Machine Co., Guelph, Ont., wants a power hack saw, a riveting machine, several 12 to 14-inch x 6-foot tool room lathes, a small surface grinder and a horizontal tapping machine. The Metal Shingle Siding Co., Ltd., Preston, Ont., is seeking a curving machine for corrugated sheets.

Buyers in New York believe that June will fall below May in total sales but in the Middle West the contrary opinion is held. Used equipment sales have taken a lead recently that has had its effect on the sale of new tools. In several instances the used machines have been given preference. This, too, in the absence of any tool sales by the government. One bidder of 90 per cent of a tool's market value has come to the conclusion the government is not selling and will not sell until its inventories are complete. Even though a dearth of buying exists in the East, traders are optimistic and cheerful and believe that appreciable buying is due in the near future. In Chicago, buying of small lots of tools is brisk and the rate of inquiry constantly is increasing. Tractor builders are out of the market but automobile builders continue to take many tools. One closed for five multiple drills in Chicago last week and several have bought miscellaneous tools in Detroit and Cleveland.

Buyers in Pittsburgh as well as elsewhere are not inclined to anticipate their requirements and are placing orders for only those tools which are absolutely needed. Heavy equipment buying in Pittsburgh is at a standstill; sellers have filed their bids and now await the awards, but buyers appear to be extremely cautious about closing.

The Worthington Pump & Machinery Co. is figuring with Chicago dealers on a large list for its Cudahy, Wis., plant. The Hudson Mfg. Co., Hastings, Minn., wants five or six tools, and the Smith Typewriter Co., Chicago, is in the market for a similar number. The New Haven Hardware Specialty Co., New Haven, Conn., has issued a fair sized list, as has the Federal Stamping Co., Holland, Mich. The Fairmount Tool & Forging Co., Cleveland, and the Steel Products Co., Detroit, each announce that they have lists in preparation.

Crane sales are at a low ebb and inquiries are mostly for one or two cranes. One export house in New York is looking for locomotive cranes for Russia, and another has an inquiry for 40 miscellaneous machine tools for shipment to France.

Despite Buying Slump, Eastern Trade is Cheerful

ALTHOUGH several sizable lists have been placed, sellers of machine tools generally, express the opinion that business in the eastern market this month will fall below the total for May. The run of miscellaneous inquiry has been fairly well maintained so far in June, but orders have been coming in slowly. One reason for this slump is attributed to the better offerings of second-hand equipment, and not a few instances are noted where this machinery has been given preference. However, it appears that there is virtually no government equipment being purchased, as the federal authorities, it is said, are making no response to bids which have been asked and received on various lots in the east from time to time. One prospective buyer lately is said to have bid 90 per cent of the price of a new machine on some equipment which had been only slightly used without obtaining a reply. Nevertheless he did not take this as an indication that the machinery went elsewhere, but rather as a sign that action is not being taken until the government inventories are finally completed.

Despite the present inactivity, sentiment in the trade continues cheerful, and prices on virtually all lines of equipment are strong. An encouraging feature at the present time is the revival in building activity in the east. While there is still room for considerable improvement, plant expansion now is being carried out on a larger scale than in months. New inquiry at this time continues limited, however.

Large lists are scarce, and the demand for replacement tools is small in the aggregate. One of the larger inquiries noted during the past week is that of a New York export house, involving about 40 miscellaneous machines for shipment to France.

Few new inquiries are noted in the eastern crane market at this time, and the business placed is not large. One 20-ton electric crane has been placed with the Toledo

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After each bar of Ludlum Steel has been fractured, examined and Brinell tested, it has to go to the straightening machines.

The machine illustrated below is for straightening small, round bars, and is operated by girls.

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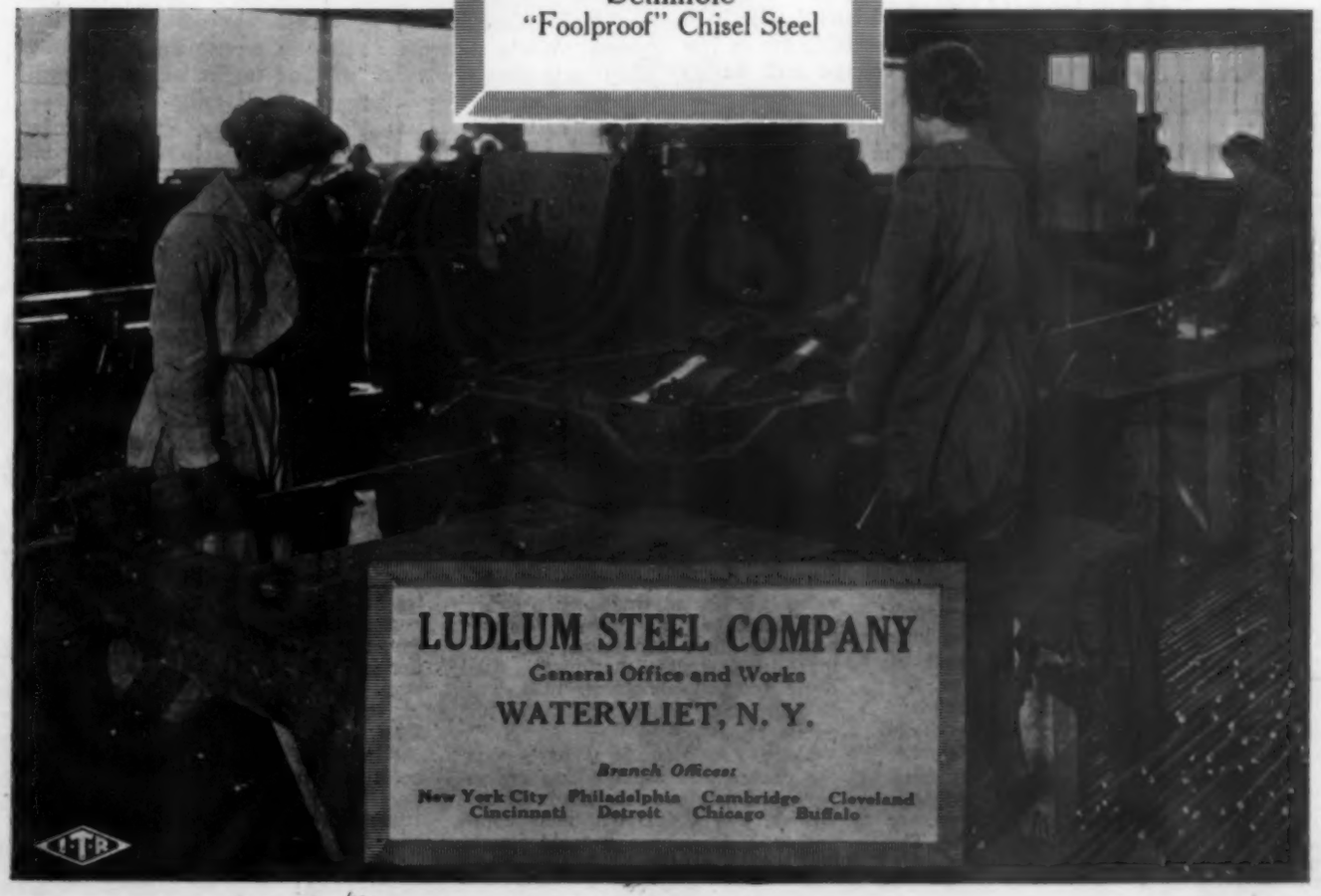

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General Office and Works
WATERVLIET, N. Y.

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New York City Philadelphia Cambridge Cleveland
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I·T·R

Bridge & Crane Co. by the Scofield Engineering Co. for the Morris Fertilizer Co., of Florida, and a 15-ton electric crane has been placed by the Edward D. Budd Mfg. Co., Philadelphia, with the Niles-Bement-Pond Co. New business includes a 2-ton jib crane for the E. W. Bliss Co., Brooklyn. The F. G. Fearon Co., 280 Madison avenue, New York, has sublet a general contract to Darling & Slade, Washington, for a power house at Boat island, Newport, R. I., which will require a 15-ton electric crane. Export inquiries include a 10-ton electric crane for Biele, Blackwell & Buck, 49 Wall street, New York. The All-Russian Union of Consumers, 136 Liberty street, New York, is asking for prices on locomotive cranes. Compania Azucarera, Humacao, Porto Rico, is inquiring for a 5-ton electric crane.

New England Builder Figures on $500,000 Order

NEW ENGLAND machine tool manufacturers report large orders and in most cases 100 per cent operating schedules are in effect. The only cause of complaint comes through labor troubles. One concern says it would increase its weekly schedule if it was felt a corresponding increase in pay to labor would be satisfactory.

Automobile manufacturers are by far the largest consumers of tools at the present time and a Connecticut manufacturer has given an option to one interest covering tools at a figure totaling $500,000.

Pittsburgh Users Order as Needed

STEADY demands are being made for machine tools in the Pittsburgh district, but no large lists are being closed. It seems to be the general policy of buyers to cover requirements as they develop, rather than to anticipate them. A great many small sales are being made, however, and the trade is hopeful that as general business improves lists of requirements again will be appearing shortly. No further price revisions lately have been made and it is believed that machine tools are as low as they will be and that the next change will be up rather than down.

In the heavier lines of equipment, matters have been more or less at a standstill lately, for manufacturers have quoted on all the projects that are in sight and now are waiting for awards. Those who have made the inquiries are moving with much caution in the matter of closing.

Brisk Buying of Small Lots Prevails

SELLING of machine tools in Chicago continues brisk with constantly increasing inquiry. A lack of large orders still prevails and most buying is for single tools. Some lines of industry formerly taking considerable equipment have ceased, notably the building of tractors. Sales of this product are slow and storehouses are filling with completed machines. This is due to the general attitude of farmers who regard prices as too high. Lack of large buying, however, is compensated by the enlarged volume of smaller orders and June promises to set a record for sales.

It is believed the Chicago, Burlington & Quincy railroad will proceed to buy at least part of the equipment for which it inquired several months ago. A builder of automobiles recently took five multiple drills aggregating about $20,000. The Worthington Pump Co. is figuring on a list of miscellaneous equipment for its Cudahy, Wis., plant. The Rock Island arsenal has renewed its inquiry for a large list of miscellaneous equipment, including cupolas, ladles and a general line of tools. This inquiry was withdrawn sometime ago because the appropriation was insufficient to meet present prices and is reinstated since added funds have been made available.

Small Inquiries the Rule in Cleveland

FEATURES are absent from the Cleveland machine tool market. Practically the only fair sized list upon which dealers are at work is the one for 16 tools detailed in this column last week from the Firestone Steel Products Co., Akron, O., which still is open. Most dealers claim that business coming their way is of a satisfactory character, although it is made up entirely of small orders. Users in many directions appear to be reluctant to close although they apparently do not expect lower prices. While sellers are at a loss to explain this attitude they state that a possible solution might be found in the labor situation. One large user of tools in Cleveland states he could operate his plant day and night but prefers to wait for the labor atmosphere to become clarified. One prominent dealer states that extensive buy-

Belgium Tracing Machinery Which Germany Stole

THAT Belgium is making progress in recovering the machinery taken from her plants by the Germans in the recent war, is the claim of Merwin Hart, a New York lawyer, who recently returned to London after an extended tour through Belgium. Mr. Hart fought in the war as an infantry captain and declares that outside of one or two places, Belgium did not suffer anything like the devastation and demolition wrought by Germany in France. Mr. Hart claims that pictures of ruined Belgium have been overdrawn and states that one is able to motor through the country for 50 meters at a stretch without guessing it had recently been within the zone of hostilities. Part of Mr. Hart's statement follows:

Belgium is as indestructible materially as she has proved to be spiritually. Already she is reviving. Her people are at work in fields, communications are being restored, and I don't think it will be long before all the mines and most of the factories will be operating.

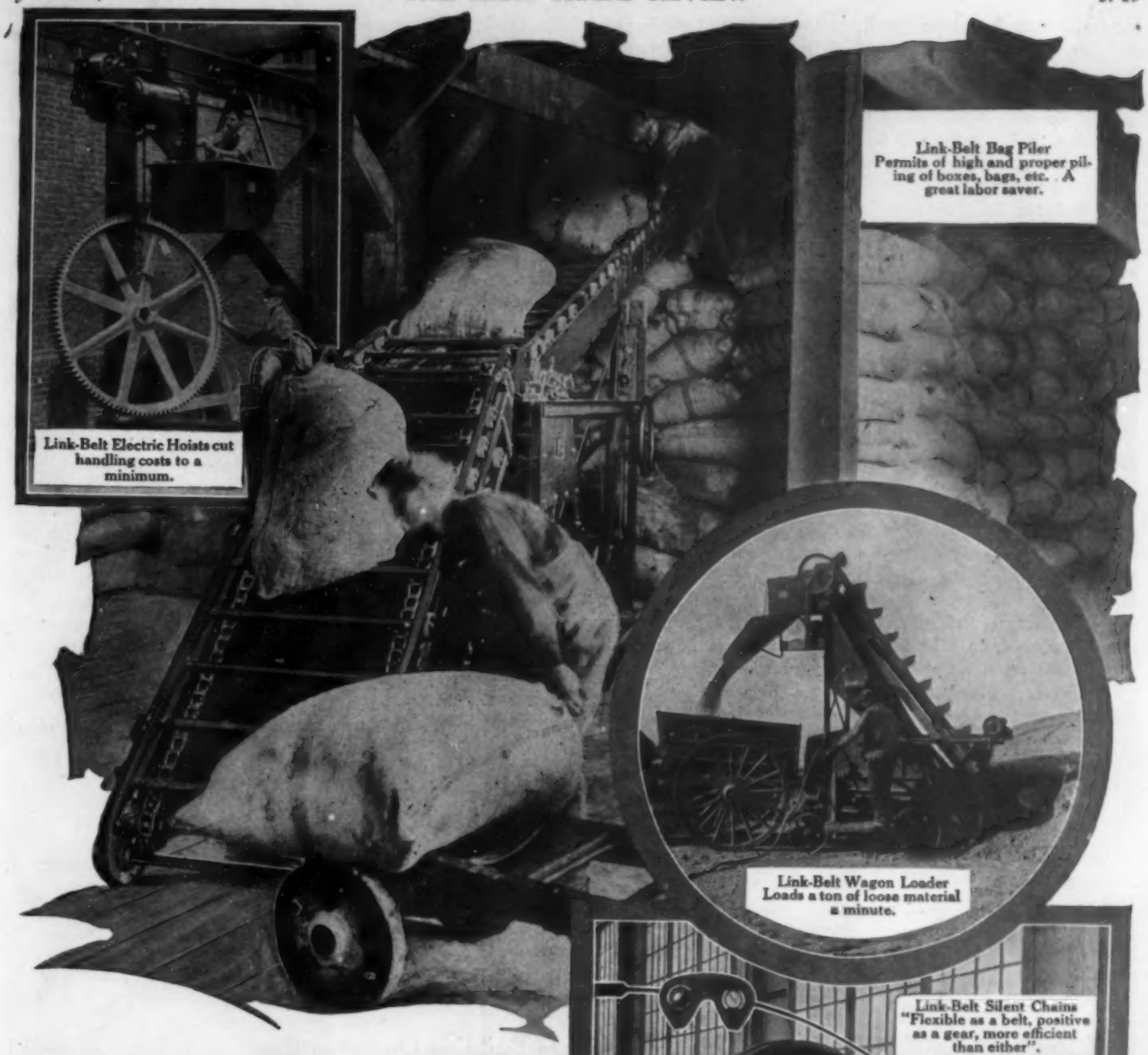
It is known that the Belgians captured some of the German documents, drawn up with Teutonic thoroughness, showing in detail precisely what machinery had been taken from each Belgian factory and where it had been sent. The business of tracing and recovering this stolen machinery has thus been considerably simplified.

The Belgians are eager to develop as big a trade as possible with America. We have a big opportunity there for selling agricultural implements, machinery, machine tools, locomotives, rails and bridges and taking contracts for public repairs.

Many American firms have seen the chance and are booking orders right and left over the heads of the British, and the Dutch, their competitors. As far as I could judge, they will not have any reason to regret the enterprise.

Indeed, if I were addressing a congress of business men in America I should say, "Get it out of your heads that Belgium is a ruined and pauper nation and that dealing with her is more philanthropy than business. Belgium offers today a better opportunity for American goods than any other country in Europe.

Send out your representatives to see for themselves and they will report that the worst of Belgium's troubles are over and the country is climbing back to prewar prosperity.


Link-Belt Electric Hoists cut handling costs to a minimum.
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Saving Time, Labor and Power

THAT'S the goal toward which we have worked for nearly half a century. How well we have succeeded is evidenced by the fact that four immense plants are now required in the production of Link-Belt power and labor saving equipment.

No matter what the nature of the material to be handled, nor the amount of power to be transmitted, our engineers can show you how to do it with greater economy than you ever thought possible. Write us. Address nearest office.

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Pittsburgh - - - - 1501 Park Bldg.	Portland, Ore. - - - First and Stark Sts.	
St. Louis - - Central Nat'l Bank Bldg.	San Francisco - - - 582 Market St.	
Buffalo - - - 547 Ellicott Square	Los Angeles - - 163 N. Los Angeles St.	
Wilkes-Barre - - - 2d Nat'l Bank Bldg.	Toronto, Can. - - Canadian Link-Belt Co., Ltd.	
Cleveland - - - 429 Rockefeller Bldg.	Denver, Lindsooth, Shubart & Co., Boston Bldg.	
Detroit - - - - 732 Dime Bank Bldg.	Louisville, Ky., Frederick Wehle, Starks Bldg.	
Minneapolis - - - 418 S. Third St.	New Orleans, C. O. Hint, Hibernia Bank Bldg.	
Charlotte, N. C. - J. S. Cothran, Com'l Bank Bldg.		

LINK-BELT

Say you saw it in THE IRON TRADE REVIEW

ing will not be done until prices become thoroughly stabilized. The policy followed by some manufacturers in recent weeks of raising and lowering prices and raising them again it is pointed out is a detriment to trade; buyers do not know what to expect and will not place an order to be delivered in 60 days with the possibility of a lower price prevailing at delivery date. The general feeling, however, is that prices have reached the low level and are bound to rise.

Inquiries call for one, two or three tools and mostly are for replacing and filling in purposes. The C. T. Coe Co., Chambersburg, Pa., wants a milling machine and a radial drill. The Canton Foundry & Machine Co., Canton, O., desires an 18 or 20-foot stroke crank shaper and a 24-inch lathe with threading and taper attachment. The American Tube & Pipe Bending Co., Cleveland, is in the market for pipe machines. The Harris Automatic Press Co., Cleveland, is in the market for two No. 4 Warner & Swasey hand screw machines and a 22-inch 4-spindle drill press. The Fairmount Tool & Forging Co., Cleveland, has increased its capitalization to $500,000 and is working on a list of its equipment requirements which will include drop forging equipment, several milling machines as well as other machine tool equipment to manufacture automobile tool kits, etc. The Ferro Machine & Foundry Co., Cleveland, is in the market for some equipment and the Torbensen Axle Co., that city, has not closed on all of its requirements; it is receiving quotations on two drilling machines and other tools. The Harris Automatic Press Co., Cleveland, is in the market for two No. 4 Warner & Swasey hand screw machines and a 22-inch 4-spindle drill press. The Star Plating & Mfg. Co., that city, is endeavoring to locate a lathe and the Troy Carriage Sun Shade Co., Troy, O., is understood to have bought a 1½-inch screw machine. The Truscon Steel Co., Youngstown, O., has commenced to buy on its recent list. The Cleveland Automobile Co., Cleveland, is believed to be lining up further tool requirements and the Winton Co., that city, is negotiating on some tools. The American Multigraph Co., Cleveland, is endeavoring to dispose of 31 screw machines and two milling machines.

Some fair sized lists are coming to Cleveland dealers from points outside of Ohio. The Hudson Mfg. Co., Hastings, Minn., wants a No. 2 universal milling machine, an 18-inch lathe, two presses and a 30-inch wood band saw. The Smith Typewriter Co., Chicago, desires a punch press, No. 2 plain milling machine, two drill presses, one 14-inch plain lathe and a surface grinder for light and tool room work. The Federal Stamping Co., Holland, Mich., also is looking for a few tools, including a 26-inch short bed lathe and a 30-inch short bed planer, one 36-inch power squaring shear, one No. 2 universal milling machine and a No. 34 or No. 35 Consolidated press. The Hubbard H. Erickson Co., Chicago, wants a medium sized lathe and a 24 or 30-inch drill press. The New Britain Machine Co., New Britain, Conn., wanted a No. 00 Brown & Sharpe automatic screw machine recently and the New Haven Hardware Specialty Co., New Haven, Conn., some tool room equipment for the manufacture of automobile hardware. Its list covers milling machines, multiple spindle power presses, turret lathes, plain grinders, bench millers, riveting machines, japanning ovens and exhaust equipment. The Commercial Engine Co., Long Beach, Cal., had a representative calling on Cleveland sellers this week, endeavoring to locate one 84-inch vertical boring mill and a large Lucas horizontal boring mill. A list of tool requirements is being prepared by the Steel Products Co., Detroit, which recently purchased the plant of the Parker Rust Proof Co. The Monarch Metal Weather Strip Co., St. Louis, Mo., will spend about $10,000 for new equipment. The Lakeside Forge Co., Erie, Pa., contemplates the early construction of a forge shop.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

DEERING JUNCTION, ME.—The American Can Co., New York, will build a 4-story, 250 x 250-foot plant estimated to cost $300,000.

BOSTON.—Bids have been taken for a structural shop, 100 x 366 feet, to cost $350,000, for the government at the Charlestown navy yard.

BOSTON.—The Seaboard Motors Corp. has been incorporated with $150,000 capital, by John S. Pfeil, Howard J. Noble and William H. Schwartz.

BOSTON.—The American Thermophone Co. has been incorporated with $1,500,000 capital, by P. Lange, Floris Meulen and R. R. Tackaberry.

BOSTON.—Bids closed June 25 for a 2-story, 100 x 366-foot addition to the structural shop at the Charlestown navy yard, estimated to cost $345,000.

BOSTON.—The Albert Johnson Co. has been incorporated to erect buildings, machinery, ways, etc., with $30,000 capital, by P. J. Flynn, Robert H. Brown and D. W. Flynn.

BOSTON.—The F. D. Pitts Co. recently was incorporated with $25,000 capital to make electrical and radio appliances, by F. D. Pitts, William B. Pitts and A. D. Moulton.

BOSTON.—The George H. Adams Co. has been incorporated to make needles, etc., with $350,000 capital, by David J. Donahue, Boston, Charles Leroy Boyer, Cambridge, Mass., and Fred C. Fernald, Boston.

BOSTON.—The Troy Foundry & Machine Co., Inc., has been incorporated to make iron products, with $1,500,000 capital, by Thomas C. Perkins, Hartford, Conn., Allan M. McCaffray, Newton, Mass., S. Bradstreet, Boston, John S. Ferris, Newton, Mass., and Alton E. Tupper, Arlington, Mass.

BOSTON.—The Ames Agricultural Implement Co. has been incorporated to make agricultural implements, with $50,000 capital, by Walter H. Peckham, Melrose, Mass., George E. Sanborn, Quincy, Mass., Frank Peckham, Newton, Mass., Clifford B. Sanborn, Norwood, Mass., and Melville H. Rowell, Reading, Mass.

CHELSEA, MASS.—The machine shop of the Lovewell-Henrici Co., Broadway and Cabot streets, recently was damged by fire. Many valuable patterns were damaged.

FALL RIVER, MASS.—Terry & Crawford, machinists, have purchased property on which to build a machine shop.

LAWRENCE, MASS.—The Mills Machine Co. has taken bids for a machine shop, 96 x 160 feet, to cost $60,000.

LAWRENCE, MASS.—The Davis Foundry Co. recently let a contract for a foundry, 100 x 200 feet, estimated to cost $60,000.

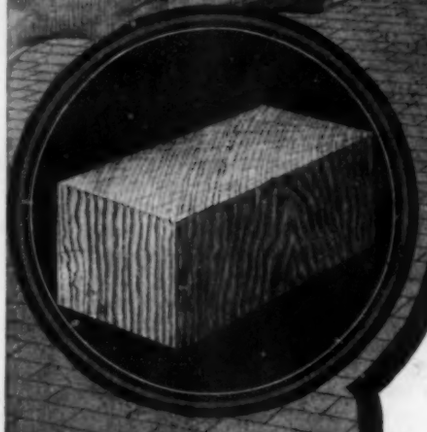
TAUNTON, MASS.—The Robertson Motor Car Co., School street, will build a 3-story machine shop, 110 x 110 feet, estimated to cost $75,000.

WORCESTER, MASS.—The Cashiko Machine Co., recently organized, has obtained a shop in the Kelley building, Foster street. John Kovar is president.

WORCESTER, MASS.—Plans are being prepared for

The Permanent Factory Floor

ARS | 5 YEARS | 10 YEARS | 20 YEARS | 30 YEARS | 40 YEARS | 50 YEARS | 60 YEARS | 70 YEA



Kreodone EVERLASTING WOOD BLOCK FLOORS

Get the *Genuine* KREODONE Blocks
Watch that Spelling
—it means Service

KREODONE Wood Block Floors never wear out or decay.

The first KREODONE Wood Block Floors, laid down more than *twenty years ago* and subjected to constant use, are still in service.

These many long years of grinding service have proved conclusively the superiority of wood block floors in every plant and factory.

There is no question but that they fill every requirement, every demand which is made on them.

Durability, sanitation, permanence, convenience and economy are only a few of the factors which enter into the superiority of the KREODONE Wood Block Floor.

The fact that these blocks are made only from long leaf yellow pine and treated only with pure, unadulterated creosote oil is perhaps the most eloquent reason why KREODONE is the only floor on the market which successfully meets every qualification.

Our Engineering Department will be glad to give you an economical and practical specification for laying and any other facts you may require. Write us.

REPUBLIC CREOSOTING COMPANY, Indianapolis, Indiana

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCH OFFICES:

315 People Gas Building, Chicago
206 Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
Berkley Ward, Norfolk
222 Society for Savings Bldg., Cleveland
31 Transportation Bldg., Philadelphia
828 Plymouth Bldg., Minneapolis
445 Central Bldg., Seattle
Masonic Temple, Mobile
211 Hammond Bldg., Detroit

a 2-story manufacturing building, and a boiler house for James Smith & Son, machinists, estimated to cost $20,000.

WORCESTER, MASS.—The Industrial Mfg. Co. has been incorporated with $50,000 capital to make motor vehicles, etc., by C. S. Higginbothan, Edmund R. Cummings and N. R. Thibert.

CENTRAL FALLS, R. I.—The Hemphill Mfg. Co., knitting machines, is reported planning a 2-story, 45 x 130-foot plant addition.

BRIDGEPORT, CONN.—The Schwardtle Stamping Co. is reported planning to build a plant, 3-stories, 40 x 100 feet, at a cost of $35,000.

HARTFORD, CONN.—The Trieschmann Mfg. Co. has been incorporated to make metal devices with $50,000 capital, by John C. Nyser, L. H. Trieschmann and Peter Christensen.

NEW BRITAIN, CONN.—The American Hardware Corp. has had plans drawn for a 5-story addition, 50 x 120 feet.

NEW BRITAIN, CONN.—The Taplin Mfg. Co., 65 Arch street, manufacturer of hardware specialties, has awarded a contract for a 2-story, 50 x 90-foot plant, estimated to cost $30,000.

NEW HAVEN, CONN.—The New Haven Malleable Iron Co. has in course of erection, an extensive addition to its plant.

NEW HAVEN, CONN.—The O. B. North & Co., 67 Franklin street, manufacturer of hardware, is reported planning to erect a 4-story, 28 x 42 x 42-foot plant addition, estimated to cost $20,000.

NEW HAVEN, CONN.—The New Haven Hardware Specialty Co., machinists, is erecting a 2-story, 40 x 60-foot building, which will be equipped for the manufacture of automobile hardware. Fred W. Voos is secretary and treasurer of the company.

North Atlantic States

BROOKLYN, N. Y.—Property has been purchased by the Flatbush Industrial Corp. on which to erect a 6-story light manufacturing building, estimated to cost $1,500,000.

BROOKLYN, N. Y.—The Pilot Processing Equipment Corp. has been incorporated with $100,000 capital, by M. A. Klaus, A.V. Pruden, W. P. White, 170 Marine avenue, and others.

BUFFALO.—Rice & Adams, manufacturers of dairy machinery, have broken ground for an extensive addition.

BUFFALO.—The Robertson-Cataract Electric Co. has a permit to erect a 6-story plant addition to cost $80,000.

BUFFALO.—The J. P. Devine Co., manufacturer of vacuum and drying machinery, is building several plant additions including a foundry.

BUFFALO.—The Optimo Disc Wheel Corp., manufacturing disc wheels, demountable rims, etc., recently was incorporated with $250,000 capital, by H. A. Sellers, H. F. Spencer and C. M. Beattie.

BUFFALO.—The Car Parts Co., Inc., capitalized at $40,000, has been chartered to manufacture equipment for passenger cars of electric and steam railways, by W. Senftle, F. X. Senftle, 129 College street and H. P. Miller, 310 Ideal street.

CARTHAGE, N. Y.—The Wilma Machine Co. will build a 2-story plant, 50 x 80 feet, estimated to cost $25,000.

DANSVILLE, N. Y.—The Power Specialty Co., manufacturer of steam and hydraulic specialties, is having plans prepared for a 2-story addition, estimated to cost $25,000.

NEWBURGH, N. Y.—The Newburgh Clay Products Corp. has been organized with $50,000 capital, by H. G. Mullen, B. Morgan and H. W. Sweet.

NEW YORK.—Robert P. Kehoe, Inc., Ryer avenue, machinery and metals, recently was incorporated.

NEW YORK.—The R. & P. Auto Enameling Co. has leased a 2-story building, 80 x 100 feet, now under construction.

NEW YORK.—The Concrete Steel Co., 42 Broadway, has purchased a site on which to erect a warehouse, 145 x 150 feet.

NEW YORK.—The Osprey Towing Co. recently was incorporated with $25,000 capital, by P. De Ronde, F. H. Hall and I. G. Prioleau, 39 Claremont avenue.

NEW YORK.—The Westen Wheel Corp. recently was incorporated with $250,000 capital, by W. S. Sawyer, C. F. Bailey and F. G. Fischer, 900 Riverside drive.

NEW YORK.—The Quaker City Metal Bed Corp. has been incorporated with $9000 capital, by N. Lierster, N. Borsuk and L. Schafran, 235 West 112th street.

NEW YORK.—The Presto Metal Stamping Corp. has been incorporated with $9000 capital, by L. Holtzman, N. Turok and L. Offerman, 833 East 170th street.

NEW YORK.—The Sherman Brass Foundry Co. recently was incorporated with $5000 capital, by H. Danzig, S. Shapiro and S. J. Sherman, 220 East 102nd street.

NEW YORK.—The Fassler & Klein Iron Works recently was incorporated with $15,000 capital, by B. D. Klein, H. Fassler and O. Frankl, 971 Kelly street, Bronx.

NEW YORK.—The United States Freezer & Machine Corp. has been incorporated with $60,000 capital, by W. Eppenbach, A. T. Light and L. F. McGrath, 1783 Webster avenue.

NEW YORK.—The Paramount Metallic Bed Co. recently was incorporated with $15,000 capital, by M. Kilinmik, S. Pollinger and J. Basile, 337 East Fourteenth street.

NEW YORK.—The Burtis-Twyeffort Co. has been incorporated to manufacture flying machines, with $50,000 capital, by H. F. Heberman, L. D. Martin and E. P. Burtis, 43 Cedar street.

NEW YORK.—The Anderson Gasometer Co., automobile and airplane devices, recently was incorporated with $20,000 capital, by I. Anderson, L. and C. Abrahams, 105 Stockton street, Brooklyn.

OSWEGO, N. Y.—The Hinckly Towing Co. is reported planning a ship repair works, estimated to cost $100,000.

ROCHESTER, N. Y.—The Rochester Auto & Tool Co. has been incorporated with $25,000 capital, by C. Wansill, K. Woudalowicz and E. F. Rzepeci.

ROCHESTER, N. Y.—The General Street Signal Corp., automatic signals, etc., has been incorporated with $75,000 by G. G. Ford, P. H. Yawman and E. J. Dwyer.

ROCHESTER, N. Y.—The Inanout Collet Mfg. Co., toolmaker and metalworker, has been incorporated with $15,000 capital, by J. F. Lobert, F. Tardier and G. Reisinger.

ROCHESTER, N. Y.—Plans have been completed by the O. R. Adams Mfg. Co. for a 1-story addition, 50 x 90 feet, estimated to cost $15,000. The company makes metalworking equipment.

SYRACUSE, N. Y.—The Pioneer Welding Co. has been incorporated with $10,000 capital, by J. A. Brown, C. J. Ryan and W. J. Lowery.

SYRACUSE, N. Y.—The B. G. H. Metal Mfg. Co., 106 South State street, has purchased property on which it is reported planning to erect a 3-story plant, estimated to cost $25,000.

WELLSVILLE, N. Y.—The Victor Aluminum Mfg. Co., J. L. Rockwell, president, Hornell, N. Y., has plans for a plant addition, 1-story, 32 x 100 feet, and estimated to cost $15,000.

WEST NEW BRIGHTON, N. Y.—The plant of the McWilliams Dry Dock & Machine Co. was badly damaged by fire.

ALLENTOWN, PA.—A 60 x 60-foot machine shop addition will be erected at the plant of the Lawfer Automobile Co.

ALLENTOWN, PA.—The plant of the Lehigh Structural Steel Co. recently was purchased by Robert Kift, formerly of the Bethlehem Construction Co., and will be enlarged.

ALTOONA, PA.—The Altoona Northern railroad will rebuild its repair shops estimated to cost $20,000.

CHESTER, PA.—The Baldt Anchor Co., N. D. Powell, president, Sixth and Butler streets, has let a contract for a plant, 1-story, 52 x 120 feet.

CONNELLSVILLE, PA. — The Windell Commercial Airplane Co. has started work on a plant here.

DAMASCUS, PA.—This city is considering building an electric light plant.

DUNBAR, PA.—The plant of the American Manganese Co. recently was badly damaged by fire.

DYSART, PA.—The boiler plant of the Sugar Run Coal Co. recently was damaged by fire. It will be rebuilt.

ERIE, PA.—The Erie City Iron Works, East avenue, plans a 1-story addition, 40 x 122 feet, estimated to cost $14,000.

FREEPORT, PA.—The Freeport Water Co. has taken bids for a waterworks plant here. J. R. Taylor is manager.

HARRISBURG, PA.—It is reported R. V. Alexander, Lancaster, Pa., has applied for a charter for the Keystone Oven Co., which will operate a plant here for the manufacture of baking equipment, etc.

HERSHEY, PA.—The Gordon Limestone Co. recently was incorporated with $5000 capital, by H. I. Miller and others.

JOHNSTOWN, PA.—The Johnstown Auto Co. is building a 2-story machine shop, 65 x 120 feet, estimated to cost $100,000.

OSCEOLA, PA.—The S. B. Stein Co., Inc., plans to build a 1-story machine shop and foundry addition, which with equipment will cost about $200,000.

PHILADELPHIA.—Bids closed June 25 for a 3-story, 107 x 400-foot pattern shop for the League Island navy yard.

PHILADELPHIA.—Ballinger & Perrot are drawing plans for a grinding shop for the Victor Talking Machine Co., Camden, N. J.

PHILADELPHIA.—Plans are being prepared for the erection of a pattern shop at the League island navy yard, 3-stories, 107 x 399 feet.

PHILADELPHIA.—Arrangements have been completed by the Wright Roller Bearing Co. for the issuance of $500,000 in stock for general expansion purposes.

PHILADELPHIA.—The General Machine Co. has awarded a contract for a $10,000 addition, 2 stories, 50 x 147 feet, to N. W. Thompson & Clementine.

PHILADELPHIA.—D. H. McGookin, 1630 North Ninth street, manufacturer of forgings, is reported planning a 1-story forge shop addition, 90 x 90 feet.

PHILADELPHIA.—The Walter H. Tinney Co., capitalized at $20,000, has been chartered to engage in galvanized iron work, by Walter H. Tinney and others.

PHILADELPHIA.—M. L. Bastian has awarded a contract to William H. Nibauer, 5248 Mascher avenue, for a machine shop, 1-story, 20 x 40 feet and 23 x 60 feet.

PHILADELPHIA.—The Montgomery Iron & Steel Co., 1832 North Ninth street, is erecting a building to enlarge the company's facilities for handling its warehouse stock. It will be 1-story, 150 x 200 feet and will be equipped with crane runways. A power plant will also be installed. Machinery and equipment requirements as yet have not been decided upon.

PITTSBURGH. — The Hogan Foundry Corp. has been incorporated with $60,000 capital, by Howard G. Hammer and others.

PITTSBURGH.—The Slag-Rock Machine Co. has

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TYPICAL ANALYSIS

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Silicon	21.07
Sulphur	.038
Phosphorus	.041
Manganese	.45

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TYPICAL ANALYSIS

Carbon	.11
Silicon	48.46
Sulphur	.023
Phosphorus	.024
Manganese	.38

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been incorporated with $5000 capital, by L. McConaughy and others.

PUNXSUTAWNEY, PA.—The Punxsutawney Storage Battery Co. has been incorporated with $5000 capital, by R. B. Kendig and others.

READING, PA.—The Philadelphia & Reading railway plans a power house, 1-story, 50 x 100 feet.

STROUDSBURG, PA.—The Universal Chain Co. is reported planning a chain factory addition, one story, 72 x 102 feet, and 18 x 130 feet, estimated to cost $15,000.

WILKES BARRE, PA.—The Sheldon Axle & Spring Co., George M. Wall, general manager, 221 Conyugham avenue, has awarded a contract for a plant addition, 2-stories, 40 x 130 feet, estimated to cost $20,000.

YORK, PA.—The York Hardware & Brass Co., capitalized at $25,000, will manufacture brass and other castings. J. Elmer, E. D. and R. F. Workman, York, and George S. MacIntosh, are the incorporators.

AVENEL, N. J.—The Steel Equipment Corp. plans to erect an addition, 2 stories, 80 x 160 feet. It has awarded the contract to the Austin Co., Cleveland. At present it is not in the market for additional equipment but may be at a later date. F. A. Danford is purchasing agent.

BELLEVILLE, N. J.—The Belleville Wire Cloth Co., 705 Washington avenue, recently was incorporated with $100,000 capital, to manufacture wire cloth, wire, etc.

BLOOMFIELD, N. J.—A $10,000 plant addition will be erected by the Peerless Tube Co.

BOUND BROOK, N. J.—The Bound Brook Oilless Bearing Co., Main street, has awarded a contract for a plant, 2-stories, 100 x 140 feet.

CAMDEN, N. J.—The Camden Motor Corp. has let a contract for a shop building, 1-story, 76 x 301 feet, estimated to cost $100,000.

IRVINGTON, N. J.—The American Abrasive Metals Co., 460 Colt street, has awarded a contract for a plant addition.

JERSEY CITY, N. J.—James Spence, 921 Garfield avenue, has plans for an addition to his foundry, 44 x 60 feet.

NEWARK, N. J.—A $12,000 machine shop will be erected by the Orchard Garage & Supply Co.

NEWARK, N. J.—A $10,000 light manufacturing building will be erected by the G. R. G. Corp.

NEWARK, N. J.—The American Aluminum Ware Co. is erecting an addition, which with machinery will cost about $45,000.

NEWARK, N. J.—The Auto Hardware Co., 272 Halsey street, has been incorporated to manufacture automobile hardware, etc., with $50,000 capital.

NEWARK, N. J.—The Jacobs Bed Spring Co. has been incorporated with $50,000 capital, by Louis, David and J. Jacobs, to engage in the manufacture of bed springs and other metal products.

NEWARK, N. J.—The M. J. Kurtz Co., calculating machines, has been organized with $25,000 capital, by Reginald Church, H. D. Earl, Nutley N. J.; and C. H. Watchett, New Brunswick, N. J.

NEWARK, N. J.—The Orchard Garage & Supply Co. is reported planning to build a machine shop estimated to cost $12,000. A. A. Lance, 52 Ficherior street, is head of the company.

NEWARK, N. J.—The Bollinger-Peck Co., 22 Pennington street, has been organized to manufacture crank pin turners and other products. Frederick P. Bollinger and Wilfred J. Peck head the company.

NEWARK, N. J.—The Cutlery Corp. of America has been incorporated with $100,000 capital, by Otto E. Quitman, William Crossant and Harry S. Creamer, Newark, N. J., and Edgar J. Schutt, Covington, N. J.

TRENTON, N. J.—The John E. Thropp's Sons Co., manufacturer of tire-making machinery, has completed plans for a 2-story machine shop, 63 x 320 feet, estimated to cost $75,000.

DOVER, DEL.—The Ruggles Co., Inc., has been organized with $1,000,000 capital, to engage in a general foundry business, by J. G. Gray, L. A. Van Court and M. B. F. Hawkins, Wilmington, Del.

BALTIMORE.—The Standard Oil Co. is reported planning a machine shop here.

BALTIMORE.—The Singer-Pentz Co. has the contract for a boiler house for the Bethlehem Steel Co.

BALTIMORE.—The Plaza Engineering Co. has let the contract to William Haselherst for a plant, 100 x 150 feet, to cost $18,000.

BALTIMORE.—The Crown Cork & Seal Co., Charles M. Hood, president, 1511 Guilford avenue, is having plans drawn for a power plant, estimated to cost $30,000.

BALTIMORE.—The City Spring Works, Preston and Park avenues, is reported planning a factory and blacksmith shop, 2-stories, 100 x 150 feet, estimated to cost $50,000.

LYNCHBURG, VA.—The Southern Electric Steel Co., Inc., Scott building, is completing plans for an electric steel foundry, 90 x 120 feet, estimated to cost $120,000.

RICHMOND, VA.—The plant of the Victoria Metal Co. recently was damaged by fire. The loss is estimated at $15,000.

Central States Activity

APPLETON, WIS.—A new tractor and engine manufacturing industry is being established here by Frank and Oscar Saiberlich, and will be operated by the Fox River Tractor Co., incorporated with $200,000 capital. A plant site has been purchased and the first unit will be 120 x 120 feet.

BELOIT, WIS.—The Badger Tool Co., recently incorporated with $75,000 capital, plans a machine shop, estimated to cost $45,000.

GRAND RAPIDS, WIS.—The common council has petitioned the state highway commission to arrange for a concrete and steel bridge across the Wisconsin river. The proposed span will be 500 feet long and be built at an estimated cost of $100,000.

JANESVILLE, WIS.—The Chas. Skidd Mfg. Co., manufacturer of dairy appliances and equipment, has increased its capital from $150,000 to $200,000 and plans to enlarge its facilities. Charles Skidd is manager.

MANITOWOC, WIS.—The Tinsel Mfg. Co., Sixteenth and Hamilton streets, is reported planning to erect a 3-story, 60 x 100-foot plant estimated to cost $80,000.

MANITOWOC, WIS.—The common council has instructed the board of public works to call for bids for a double-leaf bascule bridge, estimated to cost $140,000.

MILWAUKEE.—The Lindsay, McMillan Co. is erecting a small warehouse addition, 1-story, 50 x 150 feet.

MILWAUKEE.—The Wisconsin Bridge & Iron Co. is erecting a 1-story addition to its fabricating and erecting shop.

MILWAUKEE.—The Koehring Machine Co., manufacturer of gas engine concrete mixers, etc., is erecting a new shop, 50 x 175 feet, costing about $25,000.

MILWAUKEE.—The Milwaukee Tank Works, 851 Kinnickinnic avenue, has started work on a new plant, 100 x 260 feet and 80 x 100 feet. R. L. Blenenstock is secretary.

MILWAUKEE.—Reports are current here to the effect that the Pawling & Harnischfeger Co., manufacturer of cranes, etc., is contemplating the erection of its own steel foundry.

MILWAUKEE.—Articles of incorporation have been filed by the Ogren Motor Car Co. The company is capitalized at $500,000 and was incorporated by Harry Kuntz, M. Landeck and E. Patek.

MILWAUKEE.—The Robert L. Reisinger Co., First National Bank building, has the contract to erect a $50,000 substation and transformer plant for the Milwaukee Electric Railway & Light Co.

MILWAUKEE.—The Vilter Mfg. Co., manufacturer of ice and refrigerating machinery, engines, etc., has let a contract for plant additions to cost $125,000. The additions will include auxiliary foundry building, 40 x 80 feet.

RACINE, WIS.—An addition providing 25,000 square feet of additional floor space is being erected by the F. J. Greene Engineering Works, Douglas avenue, at an estimated cost of $25,000.

STURGEON BAY, WIS.—Johnson & Brown, machinists, are installing a 16-foot lathe and other tool equipment.

WAUPUN, Wis.—The C. A. Shaler Co., manufacturer of steam and gasoline automobile tire repair outfits, electrical devices, etc., is building a 3-story plant addition, 50 x 100 feet, estimated to cost $40,000.

WAUSAU, WIS.—Purchases of machinery and other equipment for the vocational training school, will be made immediately. The common council has appropriated $21,000 for this purpose.

WAUSAU, WIS.—The Seegar Mfg. Co., Chicago, manufacturer of heaters, etc., is moving its headquarters to this city. For the present only an assembling shop will be conducted, most of the manufacturing being done by the Wisconsin Valley Sheet Metal Works, recently established.

ADRIAN, MICH.—The United Electric Mfg. Co. has acquired the site of the Lion Motor Co. plant, on which it is reported planning to erect a $100,000 plant.

ALBION, MICH.—The Union Steel Products Co. has started work on a 2-story addition to its plant.

ANN ARBOR, MICH.—The Self-Fed Carburetor Co. has been incorporated in Delaware with $500,000 capital, by Ward Simpson, Charles Grant Bush, George Langford, Anna Spathelf and George Spathelf, all of this city.

BATTLE CREEK, MICH.—The United Steel & Wire Co. is erecting two steel and brick units, 110 x 130 feet and 86 x 90 feet. G. J. Genebach is president.

BAY CITY, MICH.—The Union Motor Truck Co. is being refinanced with $500,000 under the direction of Howard P. Woodworth. Plant expansion is planned.

CHELSEA, MICH.—The Chelsea Screw Co. and the Chelsea Steel Ball Co. are doubling their capacity.

DETROIT.—The Chas. Bohn Foundry Co., 733 Hart avenue, is taking bids for a power house, 1-story, 80 x 106 feet.

FLINT, MICH.—The Champion Ignition Co. has broken ground for its Canadian branch plant at Windsor, Ont. The building will cost about $250,000 and equipment an additional $200,000.

GRAND RAPIDS, MICH.—The National Spring & Wire Co., Chicago, will establish a plant here, 4 stories, 85 x 500 feet, to cost $200,000. S. I. Ginsburg is president.

HOWARD CITY, MICH.—The Gillett Motor Products Co. has been organized to manufacture automobile parts.

KALAMAZOO, MICH.—The Atlas Press Co., John H. Penniman, president, is erecting a new plant, 80 x 250 feet.

KALAMAZOO, MICH.—The Limousine Top Co. will increase its capital from $100,000 to $200,000 to provide for plant expansion. J. D. Bobb is president.

LANSING, MICH.—The Novo Engine Co. recently awarded a contract for a foundry, 90 x 100 feet and 100 x 160 feet, estimated to cost $100,000.

LANSING, MICH.—The Lansing Body Co. has purchased the plant of the Acme Engine Co. and is

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erecting a new building which will double the present floor space.

MARCELLUS, MICH.—The Chapman Engine Works, recently organized, is capitalized at $13,000. Herman L. Chapman is head of the company.

MT. PLEASANT, MICH.—The Transport Truck Co. will build a plant, 100 x 300 feet, for the manufacture of motor trucks and parts, and a power plant.

MUSKEGON, MICH.—The Continental Motor Mfg. Co. is reported contemplating a plant addition.

RIVER ROUGE, MICH.—The Ford Motor Co. is reported planning to alter its shipbuilding plant into a manufacturing plant.

ST. JOHNS, MICH.—The Triangle Motor Truck Co. will build an addition, its capitalization having been increased recently from $100,000 to $200,000.

ST. LOUIS, MICH.—The Bollstrom Motor Co. has started work on the first unit of its automobile plant.

YPSILANTI, MICH.—The Wolverine Forge Drill Co., recently organized by George J. Crossman, president of the Crossman Stamping Co., will erect a plant.

ZEELAND, MICH.—The Federal Stamping Co., with a capital of $25,000, has been organized to combine the Federal Tool & Stamping Co. and Holland Lighting & Specialty Co. Thomas Ollinger is president.

CAIRO, ILL.—The Tideman Electric Mfg. Co., Menominee, Mich., is reported planning to erect a plant here. W. J. Tideman is manager.

CHICAGO.—The Ursus Motor Co. has bought a site on which to erect a plant for the manufacture of tractors and trucks.

CHICAGO.—Sam H. Rosenthal, 2909 Indiana avenue, is having plans drawn for a machine shop, 1-story, 70 x 190 feet.

CHICAGO.—The Independent Tool Corp., 139 South Irving avenue, has awarded contracts for a 1-story plant, 51 x 115 feet.

BRYAN, O.—According to W. W. Wood of the Bryan Screw Machine Products Co., which recently increased its capital from $50,000 to $100,000, at present the company does not plan to enlarge its plant, but may purchase some additional machinery shortly.

CANTON, O.—The Timken Detroit Axle Co. has started on the erection of a machine shop addition, to occupy 20,000 feet of floor space. Walter MacGregor is general manager.

CINCINNATI.—Tentative plans for increasing the capacity of the Pollak Steel Co. have been prepared. The plant is at Carthage, O. J. A. Pollak is secretary.

CINCINNATI.—The former bottling plant of the Millcreek Distilling Co., Evans street, has been transferred to the Hill-Brunner Foundry Supply Co., which plans to manufacture foundry facings.

CLEVELAND.—The Lake Erie Metal Products Co. has been incorporated with $20,000 capital, by John P. Kalma, James F. Strand and others.

CLEVELAND.—The Leonard Electric Co., 423 Champlain avenue, plans the erection of a plant, 85 x 115 feet.

CLEVELAND.—The United Valve & Motor Parts Mfg. Co. recently was incorporated with $100,000 capital, by T. J. Carlen, L. L. Rood and others.

CLEVELAND.—The Cleveland Metal Products Co. has taken out a permit to erect a plant addition, 1-story, 120 x 300 feet, estimated to cost $120,000.

CLEVELAND.—A contract has been let by the Ohio Electric & Controller Co., 5800 Maurice avenue, for the erection of a plant, 2 stories, 80 x 100 feet.

CLEVELAND.—The Towmotor Co. has been incorporated with $200,000 capital, by Car A. Alburn, 610 Garfield building, Lester M. Sears, William S. Kiesel, H. F. Ellsworth and F. E. Russell.

CLEVELAND.—The Metals Welding Co. recently was incorporated with $200,000 capital, by Frank H. Ginn, Williamson building, W. B. Cockley, James P. Wood, W. T. Kinder and others.

CLEVELAND.—The Drop Die & Engineering Co. recently was incorporated with $25,000 capital, by George H. Stegkemper, Philip Frankel, Joseph E. Rice, R. W. Judd and Frederick Frankel, 1019 Guardian building.

COLUMBUS, O.—The American Chain Co. is reported contemplating the erection of a new plant.

COLUMBUS, O.—The Reilly Mfg. Co., machinery, steel bars, etc., recently was incorporated with $20,000 capital, by John J. Reilly, A. Bringardner, S. W. Reilly and others.

DAYTON, O.—The Central Engineering Co. has been incorporated with $25,000 capital, by James K. Davis, M. O. Swinehart and others.

DAYTON, O.—The Edwards Specialty Co. shortly will start the construction of a 2-story plant to be devoted to the repairing of automobiles, etc.

DAYTON, O.—The Dayton Insulating Die Co. and the Dayton Oxygen & Hydrogen Products Co. will erect a 2-story building, costing about $45,000. G. A. Kurtz is interested in both companies.

DAYTON, O.—The A. C. Electrical Mfg. Co. recently was incorporated with $100,000 capital, by R. Harry Croninger, Vincent G. Apple, C. L. Bauman, H. J. Chancellor and Morris P. Cromer.

EAST CLEVELAND, O.—The Nickel Plate Foundry Co., care of R. P. Chamberlain, 948 Engineers building, Cleveland, has awarded a contract for a foundry, 74 x 100 feet, estimated to cost $30,000.

GALION, O.—The American Steel Grave-Vault Co. has acquired a site on which it plans to erect an addition to its plant. F. F. Unckrich is president.

HAMILTON, O.—The Hamilton Castor Co. has taken out a permit to erect a building at a cost of $10,000.

SANDUSKY, O.—The Macultivator Co., recently organized to manufacture motor cultivators, is occupying a building formerly occupied by the Ohio Engine Co., but according to Charles S. McCarthy Jr., president, the company is planning to build a new plant in the near future.

SPRINGFIELD, O.—It has been reported that the Superior Gas Engine Co. contemplates the erection of three plant additions.

SPRINGFIELD, O.—The Concrete Steel Construction Co. has the contract for the erection of three additions to the plant of the Springfield Spring Co.

TOLEDO, O.—The Shur-Woodruff Iron & Metal Co. recently was incorporated with $50,000 capital, by Louis Shur and Meyer J. Woodruff.

TOLEDO, O.—The Toledo Enamel Wire Products Co. has been incorporated with $14,000 capital, by Jerome Ackerman, Seymour Hirsch and others.

ASHLAND, KY.—This city is taking bids for a bond issue of $90,000 for a waterworks plant. H. R. Dyarris mayor.

Throughout the West

MINNEAPOLIS.—The board of park commissioners has voted to build a bridge over Lake Nokomis at Cedar avenue, at an estimated cost of $100,000.

ATLANTIC, IOWA.—The Schrauger & Johnson Co., manufacturer of lightning rods, has purchased adjoining property on which it is reported planning to build an addition.

DES MOINES, IOWA.—The Peoria Tractor Corp., 1024 Jefferson building, Peoria, is reported planning to erect a plant here.

KANSAS CITY, MO.—The Rex Spray Co., manufacturer of spraying equipment, is taking bids for a 2-story plant, 50 x 100 feet.

KANSAS CITY, MO.—The United Iron Works will increase its capacity, its capitalization having been increased from $650,000 to $2,500,000.

ST. JOSEPH, MO.—Bonds for $500,000 have been voted for an addition to the municipal electric light plant.

ST. JOSEPH, MO.—Swift & Co. will erect a 2-story addition to its boiler house at its plant here. The extension will cost $40,000.

ST. LOUIS.—The Chevrolet Motor Co. is having plans drawn for a plant addition.

ST. LOUIS.—The Trione Piston Ring Co., Pontiac building, will build a plant containing 50,000 square feet for the manufacture of piston rings.

ST. LOUIS.—The Bowman Realty & Bonding Co., National Bank building, is reported having plans drawn for a foundry, shop, office and store buildings.

ST. LOUIS.—The St. Louis Mfg. Co., 5401 Bulwer avenue, has awarded a contract for a 1-story, 426 x 432-foot plant, to be used for making automobile bodies.

ST. LOUIS.—The Universal Motor Truck & Tractor Engine Co., Syndicate Trust building, has purchased a site on which it is reported planning to erect a plant at an estimated cost of $50,000.

BLYTHEVILLE, ARK.—James A. Reese of this city, recently purchased an iron foundry in Tennessee, and is reported planning to move the plant to this city

TEXARKANA, ARK.—The Southwestern Gas & Elec. Co. is reported planning a new plant, to include machine and forge shops.

DALLAS, TEX.—The Dallas Power & Light Co., Interurban building, will build a substation, at a cost of $250,000. J. H. Gill is engineer.

FT. WORTH, TEX.—The Double Seal Ring Co., 109 Throckmorton street, is reported planning the erection of a 1-story, 75 x 180-foot plant, to be devoted to the manufacture of piston rings, etc.

GORMAN, TEX.—The Mutual Machine & Tool Co. has been organized with $32,000 capital, by James McCamey, Charles J. Chulow and C. B. Davis.

SAN JOSE, TEX.—The Stroud Motor Mfg. Co. plans to build a plant to consist of three units, estimated to cost $50,000. W. C. Rarig, San Antonio, Tex., is engineer.

TULSA, OKLA.—The Hinderlila Tool Co., Madison street, will build a 1-story, 68 x 125-foot addition.

TULSA, OKLA.—The Economy Car Appliance Co. will spend about $100,000 in equipping a plant for the manufacture of automobile appliances.

MANHATTAN, KANS.—The power plant of the Rocky Ford Milling & Power Co. recently was badly damaged by fire. The loss is estimated at $150,000.

OMAHA, NEBR.—A $150,000 bridge will be built at Yutan, Nebr., to span the Platte river.

COLORADO SPRINGS, COLO.—The Rebuilt Machinery Co. has been formed by the Hassell Iron Works, in connection with a Denver firm of consulting engineers. The company will rebuild machinery.

NEWTON, IDAHO.—A special election will be held June 30 on a bond issue of $90,000 for a municipal electric light plant.

OGDEN, UTAH.—The Western Tool Mfg. Co., capitalized at $99,000, has been chartered to manufacture machinery, etc., by Oral C. Smith, George L. Smith and Guy H. Stalker.

HILLTOP, ARIZ.—The Hilltop Mining & Smelting Co. is reported planning to build a smelter. O. Fife is manager.

HILLTOP, ARIZ.—The Ajax Metal Mining Co. is reported planning to build a 150-ton flotation mill. N. P. Wilson is manager.

PHOENIX, ARIZ.—An election will be held in September for a bond issue for the Verde river water system to cost $1,315,000.

New Business in Canada

SHAUNAVON, SASK.—The Shaunavon Light, Power & Milling Co., Ltd., has been incorporated to build and operate electric power plants, with $95,000 capital, by G. W. Tinck, John H. Fleming and A. A. Neuelly.

LACALA TORTUE, QUE.—Tourbieres Des Laurentides will build a turf coal plant to cost $20,000, and is in the market for machinery and equipment. B. J. Guerin, N. Gareau and others are interested.

LAVAL, QUE.—The metal stamping works, owned by the Laval Industrial Co., recently was damaged by fire, with a loss estimated at $18,000.

MONTREAL, QUE.—The Montreal Tramways Co., 78 Craig street west, has let the general contract to F. A. Grothe, 6 Cuthbert street, for an addition.

MONTREAL, QUE.—The Binghamton Steamship Co., Ltd., has been incorporated to build and operate vessels, with $50,000 capital, by E. M. McDougall, Leslie G. Bell and S. C. Demers.

MONTREAL, QUE.—The Pilot Steel & Tool Co. has been incorporated to manufacture iron, steel, etc., with $15,000 capital, by Arthur R. Holden, P. A. Badeaux and Herbert W. Shearer.

MONTREAL, QUE.—The Gates Refractories, Ltd., recently acquired a plant, and the erection of kilns and the installation of machinery has been started for the manufacture of refractory brick, etc.

MONTREAL, QUE.—The Canadian Safety Fuse Co., Ltd., has been incorporated to manufacture explosives, etc., with $300,000 capital, by G. W. MacDougall, William B. Scott, Linton H. Ballantyne and others.

MONTREAL, QUE.—Gzias Chauvin, 98 Darling street, Hochelaga, Que., has been awarded the general contract by the Dominion Carriage Co., Sherbrooke, Que., for a plant here, estimated to cost about $50,000.

MONTREAL, QUE.—The General Combustion Co. of Canada, Ltd., has been incorporated to manufacture combustion devices, with $100,000 capital, by Milton Hersey, Henry H. Vaughan, Walter A. Jansen and others.

ST. HYAVINTHE, QUE.—The Casavants Phonograph Co. will build an addition at an estimated cost of $40,000. Samuel Casavant is general manager.

GALT, ONT.—The Galt Brass Co., Ltd., has been incorporated with $500,000 capital, by Arthur W. Homestead, Albert R. Kinnear and Arthur B. Mortimer.

GODERICH, ONT.—The Convertible Tractor Corp., St. Paul, is making preparations for the erection of a plant here. C. F. Megow is vice president.

HAMILTON, ONT. — Perritts & Spencer, Bury, England, have purchased a site here and will erect a manufacturing plant.

HAMILTON, ONT.—The Beaver Motor Truck Co., recently organized, will build a plant for the manufacture of 2-ton trucks.

HAMILTON, ONT.—The Hoover Suction Sweeper Co., North Canton, O., has let the general contract to W. H. Cooper, Clyde building, for a plant.

LEASIDE, ONT.—The new Canadian National railway shops here are rapidly nearing completion. They consist of a power house, round house, locomotive repair shop, car repair shop and transfer plant.

MOUNT FOREST, ONT.—Ernest Bros. are having plans prepared for an addition to their foundry, and are asking for prices on material and equipment.

OSHAWA, ONT.—Tenders are in for a plant here for the Gananoque Spring & Axle Co. A. F. Byers & Co., 340 University avenue, Montreal, Que., is architect and engineer.

OSHAWA, ONT.—The Olds Motor Works of Canada, Ltd., has been incorporated to manufacture automobiles, with $10,000 capital, by William S. Morlock, Sydney E. Wedd and Roy B. Whitehead.

TORONTO, ONT. — The Webber Motor Supplies, Ltd., has been incorporated to manufacture motor supplies, with $400,000 capital, by Roy H. Webber, Ben J. Sutherland and Edward L. Middleton.

TORONTO, ONT.—The Webber Motor Supplies, Ltd., capitalized at $40,000, has been chartered by Roy H. Weber, 287 Delaware avenue, Edward L. Middleton, room 501, 157 Bay street and others.

VANCOUVER, B. C.—The Morrison Steel & Iron Works, has a permit for a plant.

VANCOUVER, B. C.—The Electrical Mfg. Co., 41 Alexander street, is reported planning the erection of a 1-story, 50 x 110-foot plant.

VANCOUVER, B. C.—The Hyatt Steel Products co., has re-opened its rolling mill at Port Moody, B. C., and is improving and extending its steel plant.

VANCOUVER, B. C.—The Canadian government is to make a grant of $100,000 toward the cost of an experimental plant for the treatment of complex ores, according to an announcement by William Sloan, minister of mines.

Business Changes Recently Announced in the Trade

NINETEEN years ago, the Des Moines Bridge & Iron Co. was organized and began business in Des Moines, Iowa. About 10 years later the Pittsburgh plant and office was built and its name was later changed to the Pittsburgh-Des Moines Steel Co. With the rapid growth of the business, it has been necessary to establish branches at New York, Washington, Chicago, Dallas, Tex., San Francisco as well as at Chatham, Ont. To eliminate unnecessary expense and confusion, the Pittsburgh name has been adopted for the Des Moines plant, which hereafter will be known as the Pittsburgh-Des Moines Steel Co.

The Thomas D. Prosser Co. for the past 15 years located in the Schmulbach building, Wheeling, W. Va., opened a new office June 1 at Wooster, O. It will be the main office, with branches at Wheeling, Pittsburgh and Philadelphia. The lines handled include pig iron, billets, rails, bars, structural shapes, plates, scrap, mill cinder and roll scale, fluorspar, coke, coal, etc.

* * *

The National Device & Drill Co. has changed its name to the Ypsilanti Twist Drill Co.

* * *

The Attwood Brass Co., Grand Rapids, Mich., has moved into a 2-story factory, 50 by 200 feet.

* * *

The Briscoe Devices Co. plant, formerly of Jackson, Mich., will be moved into a plant 60 x 200, being erected in Pontiac, Mich., in July. Frank Briscoe is president.

* * *

Peninsular Tool Salvage Co., Detroit, has changed its name to the Tool Salvage Co.

* * *

The Bordon Co., Warren, O., manufacturer of die cutters and die stocks, has opened an office at 549 West Washington boulevard, Chicago, in charge of Charles A. Green.

* * *

L. A. Green, rails, machinery and equipment, recently moved into larger quarters on the eleventh floor of the First National Bank building, Pittsburgh.

* * *

The Keller Pneumatic Tool Co., Grand Haven, Mich., and Chicago, has found it necessary to open up a Washington office, 509 Munsey building, due to the growth of its navy yard business. W. H. Woody is in charge.

* * *

The Central Steel Co., Massillon, O., has established offices in rooms 948-49-50 Book building, Detroit, with Arthur Schaeffer and Frank Gibbons in charge.

* * *

The National Tool & Manufacture Co., St. Louis, has changed its name to the Bluebird Mfg. Co.

* * *

The Barber-Colman Co., Rockford, Ill., has opened a branch office at 451 Ellicott Square building, Buffalo, in charge of C. G. Kaelin.

* * *

General offices of the Laclede Steel Co., St. Louis, Mo., have been removed from the Laclede building to the Arcade building, Eighth and Olive streets. D. F. Exchenbrenner is general sales agent.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ores

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Warehouse Prices

Steel bars, Boston	3.40c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.27c
Steel bars, Detroit	3.33c
Steel bars, Philadelphia	3.10c to 3.25c
Steel bars, New York	3.37c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.33c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.45c
Iron bars, Boston	3.40c
Iron bars, Buffalo	4.15c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.33c
Iron bars, Philadelphia	4.30c
Iron bars, New York	3.37c
Shapes, Chicago	3.447c
Shapes, Detroit	3.43c
Shapes, Boston	3.50c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.37c
Shapes, Philadelphia	3.37c
Shapes, Buffalo	3.55c
Shapes, Cincinnati	3.43c
Plates, Buffalo	3.75c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.70c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.57c
Plates, Philadelphia	3.57c
Plates, Cincinnati	3.63c
No. 10 blue anl. sheets, N. Y.	4.57c
No. 10 blue anl. sheets, Chicago	4.57c
No. 10 blue anl. sheets, Cleveland	3.50c
No. 10 blue anl. sheets, Boston	4.85c
No. 10, blue anl., Buffalo	4.65c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.53c
No. 10 blue anl. sheets, St. Paul	4.795c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.37c
No. 28 black sheets, New York	5.37c
No. 28 black sheets, Cleveland	4.60c
No. 28 black sheets, Boston	5.90c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.33c
No. 28 black sheets, St. Louis	5.30c
No. 28 black sheets, St. Paul	5.595c
No. 28 black sheets, Buffalo	5.70c
No. 28 galv. sheets, Chicago	6.72c
No. 28 galv. sheets, Boston	7.10c
No. 28 galv. sheets, Cleveland	5.95c
No. 28 galv. sheets, Cincinnati	6.38c
No. 28 galv. sheets, Detroit	6.68c
No. 28 galv. sheets, St. Louis	6.79c
No. 28 galv. sheets, Buffalo	7.05c
No. 28 galv. sheets, New York	6.50c
Bands, Boston	4.70c
Bands, Detroit	4.03c
Hoops, Boston	4.70c
Hoops, Detroit	4.03c

Sheet Schedule

Black

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long.

Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28, 30 and 36 inches wide by 72, 84, 96 and 120 inches long.

Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90

Virginia furnaces to:

Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	4.25

Chicago to:

Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galvanized
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44

Lap Weld

2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42
2-inch	48½	36

Lap Weld

2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44

Lap Weld

2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
⅝ to 1½-inch	45½	35
2 to 2½-inch	47½	37

Lap Weld

2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	28

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black	Galvanized
⅛ and ¼-inch	29½	2½
⅜-inch	30½	3½
½-inch	34½	16½
¾ to 1½-inch	39½	23½

Lap Weld

2-inch	32½	18½
2½ to 6-inch	34½	21½
7 to 12-inch	31½	18½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼, ⅜-inch	28½	11½
½-inch	33½	20½
¾ to 1½-inch	39½	24½

Lap Weld

2-inch	33½	20½
2½ to 4-inch	35½	23½
4½ to 6-inch	34½	22½
7 and 8-inch	26½	14½
9 and 12-inch	21½	9½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Black	Galvanized
½-inch	20½	8½
⅝ to 1½-inch	25½	13½

Lap Weld

2-inch	20½	8½
2½ to 4-inch	22½	13½
4½ to 6-inch	21½	12½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16

Announcement

The General Steel Company of Milwaukee, Wisconsin, does not maintain any Chicago office, and bears no connection or relationship to any other company with the same name in any state.

Our Detroit Representative is
D. J. Crowley, 832 Dime Bank Building
Our Chicago Salesman is J. C. Glass

Electric GS Steels

Is Our Identification

GENERAL STEEL COMPANY
MILWAUKEE, WISCONSIN

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$18.50 to 19.00
Chicago	18.00 to 18.50
Eastern Pennsylvania	16.00 to 17.00
Cleveland	18.00 to 19.00
St. Louis	17.00 to 17.50
Buffalo	16.50 to 17.00
New York (dealers' prices)	13.25 to 13.75
New Jersey points	14.00 to 14.50
Cincinnati	15.00 to 15.50
Birmingham	14.00 to 15.00
Valleys	16.50 to 17.50
Boston (dealers)	12.50 to 13.00

BUNDLED SHEETS

Pittsburgh	$14.50 to 15.00
Eastern Pennsylvania	13.00 to 14.00
Cleveland	14.00 to 14.50
Buffalo	12.00 to 13.00
Cincinnati	10.50 to 11.00

STEEL RAILS, SHORT

Chicago	$20.00 to 20.50
Cleveland	20.50 to 21.00
Boston (Dealers)	11.50 to 11.75
St. Louis	17.00 to 17.50
Birmingham	12.00 to 14.00
Cincinnati	15.00 to 15.50

STOVE PLATE

Pittsburgh	$17.00 to 18.00
Chicago	19.00 to 19.50
Eastern Pennsylvania	18.00 to 19.00
Cleveland	19.00 to 20.00
St. Louis	17.00 to 17.50
Buffalo	19.00 to 20.00
New Jersey points	17.25 to 18.25
Cincinnati	15.50 to 16.00
Birmingham	20.00 to 21.00
Boston (consumers)	17.50 to 18.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$21.00 to 22.00
Chicago, billet and bloom crops	21.00 to 22.00
Eastern Pennsylvania unguaranteed	17.50 to 18.50
Eastern Penna. (guaranteed)	23.00 to 23.50
Buffalo	21.00 to 22.00

SHOVELING STEEL

Chicago	$17.50 to 18.00
St. Louis	15.50 to 16.00

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$19.00 to 19.50
Chicago	20.00 to 20.50
St. Louis	17.00 to 17.50

BALED SHEETS

Pittsburgh	$17.50 to 18.00
Chicago	14.00 to 14.50

FROGS, SWITCHES, GUARDS

Chicago	$18.00 to 18.50
St. Louis	16.50 to 17.00
Eastern Pennsylvania	17.50 to 18.50

BOILER PLATE, CUT

Chicago, No. 1	$15.50 to 16.00
St. Louis, No. 1	13.50 to 14.50

ANGLE BARS—STEEL

Chicago	$19.50 to 20.00
St. Louis	16.50 to 17.00

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$19.00 to 20.00
Pittsburgh, No. 2	18.00 to 19.00
Chicago, No. 1	19.50 to 20.00
Chicago, No. 2	18.50 to 19.00
Eastern Pennsylvania, No. 1	23.00 to 24.00
Cleveland, No. 1	20.00 to 21.00
St. Louis, No. 1	18.50 to 19.00
St. Louis, No. 2	17.50 to 18.00
Buffalo, No. 1	20.00 to 20.50
Cincinnati, No. 1	18.00 to 18.50
Birmingham, No. 1	13.00 to 15.00
New York No. 1 (dealers' price)	18.50 to 19.50
Valleys No. 1	18.00 to 19.00
Boston (dealers)	17.00 to 17.50

WROUGHT PIPE

Eastern Pennsylvania	$17.50 to 18.50
Eastern Pennsylvania, ungraded	11.00 to 12.00
Buffalo	15.00 to 16.00
New York	15.00 to 15.25
Boston (dealers)	14.50 to 15.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$19.00 to 20.00

CITY WROUGHT

New York, long (dealers' price)	$17.00 to 17.50
New York, special	14.50 to 14.75

BUSHELING

Chicago, No. 1	$18.00 to 18.50
Chicago, No. 2	13.50 to 14.00
Cleveland, No. 1	17.00 to 18.00
Cleveland, No. 2	15.75 to 16.25
St. Louis, No. 1	16.00 to 16.50
Buffalo, No. 1	14.00 to 15.00
Cincinnati, No. 1	14.00 to 14.50
Eastern Pennsylvania, No. 1	15.00 to 16.00

MACHINE SHOP TURNINGS

Pittsburgh	$10.50 to 11.00
Chicago	8.50 to 9.00
Eastern Pennsylvania	11.50 to 12.50
Cleveland	10.00 to 10.50
Buffalo	8.00 to 9.00
New York (dealers' price)	7.50 to 8.00
St. Louis	9.00 to 9.50
Cincinnati	7.00 to 7.50
Birmingham	6.50 to 7.50
Valleys	11.00 to 11.50
Boston (dealers)	7.00 to 7.50
Boston (blast furnace) (dealers)	6.50 to 7.00

CAST IRON BORINGS

Pittsburgh	$11.50 to 12.00
Chicago	11.50 to 12.00
Eastern Pennsylvania	13.00 to 14.00
Cleveland	12.00 to 12.50
St. Louis	9.00 to 10.00
Buffalo	11.50 to 12.50
New York (dealers' price)	10.00 to 10.50
Cincinnati	8.00 to 8.50
Birmingham	6.50 to 7.50
Valleys	11.50 to 12.00
Boston (dealers)	9.00 to 9.50
Boston (blast furnace)	8.50 to 9.00

IRON AXLES

Pittsburgh	$26.00 to 27.00
Chicago	31.00 to 31.50
Eastern Pennsylvania	28.00 to 30.00
Cleveland	29.00 to 31.00
St. Louis	30.00 to 31.00
Buffalo	26.00 to 27.00
Cincinnati	23.50 to 24.00

IRON RAILS

Chicago	$22.00 to 23.00
Cleveland	24.00 to 25.00
St. Louis	22.50 to 23.00
Buffalo	23.00 to 24.00
Cincinnati	23.00 to 23.50

PIPES AND FLUES

Chicago	$15.50 to 16.00
Cleveland	15.50 to 16.00
St. Louis	15.00 to 15.50
Cincinnati	13.50 to 14.00

GRATE BARS

Chicago	$18.75 to 19.25
Cleveland	17.50 to 18.00
Buffalo	19.00 to 20.00
New Jersey points	16.25 to 17.00
Eastern Pennsylvania	16.50 to 17.50

FORGE FLASHINGS

Cleveland, large	$13.00 to 14.00
Cleveland, small	15.75 to 16.25
Chicago, small	14.50 to 15.00
Boston (dealers)	10.00 to 10.50

FORGE SCRAP

Chicago	$18.50 to 19.00
Eastern Pennsylvania, No. 1	12.00 to 13.00

ARCH BARS AND TRANSOMS

Chicago	26.00 to 27.00
St. Louis	23.00 to 23.50

ANGLE BARS—IRON

Chicago	$22.00 to 22.50
St. Louis	19.50 to 20.00

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$15.50 to 16.00
Eastern Pennsylvania	11.00 to 12.00
Boston (dealers)	7.75 to 8.00
Cleveland	15.00 to 15.50
Buffalo	13.00 to 14.00
Chicago	13.00 to 13.50

STEEL CAR AXLES

Pittsburgh	$25.00 to 26.00
Eastern Pennsylvania	28.00 to 30.00
Cleveland	28.50 to 30.00
St. Louis	26.00 to 26.50
Buffalo	26.00 to 27.00
Chicago	28.00 to 28.50
New York (dealers' price)	21.25 to 22.25
Birmingham	20.00 to 23.00
Boston (dealers)	19.00 to 20.00

SHAFTING

Eastern Pennsylvania	$24.00 to 26.00
St. Louis	23.00 to 23.50
New York (dealers' price)	19.25 to 20.25
Chicago	24.00 to 25.00

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh iron	$24.00 to 24.50
Pittsburgh, steel	19.00 to 19.50
Chicago, iron	23.00 to 23.50
Eastern Pennsylvania, iron	23.00 to 24.00
Cleveland, iron	23.00 to 24.00
St. Louis, iron	23.50 to 24.00
Buffalo, iron	22.50 to 23.50
Birmingham, iron	21.00 to 23.00
Birmingham, tram car	21.00 to 23.00
Boston	23.00 to 24.00
Cincinnati	18.00 to 18.50

NO. 1 CAST SCRAP

Pittsburgh, cupola	$21.00 to 22.00
Chicago, cupola	24.50 to 25.00
Eastern Pennsylvania, cupola	22.00 to 23.00
Cleveland, cupola	23.00 to 24.00
New York, cupola (dealers' price)	19.00 to 20.00
Cincinnati, No. 1, cupola	21.00 to 21.50
Birmingham, cupola	22.00 to 24.00
St. Louis, railroad	24.00 to 24.50
St. Louis, agricultural	23.50 to 24.00
Buffalo	22.50 to 23.00
Boston	23.50 to 24.50

HEAVY CAST

New York (dealers' price)	$19.00 to 20.00
Buffalo	21.00 to 22.00
Pittsburgh	19.00 to 20.00
Eastern Pennsylvania	18.00 to 20.00
Cleveland	18.50 to 19.00
Boston	19.00 to 19.50

MALLEABLE

Pittsburgh, railroad	$15.00 to 16.00
Pittsburgh, agricultural	14.00 to 15.00
Chicago, railroad	19.50 to 20.00
Chicago, agricultural	18.50 to 19.00
Eastern Pennsylvania, No. 1 cupola	18.00
Eastern Pennsylvania, ordinary	18.00
Cleveland, railroad	18.50 to 19.00
Cleveland, agricultural	16.00 to 16.50
St. Louis, railroad	15.50 to 16.00
St. Louis agricultural	14.50 to 15.00
Cincinnati, railroad	15.00 to 15.50
Cincinnati, agricultural	14.00 to 14.50
Boston	12.00 to 12.50
Buffalo	19.00 to 20.00

Miscellaneous Scrap

Gross Tons Delivered to Consumer

REROLLING RAILS

5 feet and over

Pittsburgh	$21.50 to 22.00
Chicago	21.00 to 21.50
Eastern Pennsylvania	19.00 to 20.00
Cleveland	18.50 to 19.50
St. Louis	19.00 to 19.50
Birmingham	15.00 to 16.00
Boston (dealers)	13.00 to 13.50

LOCOMOTIVE TIRES

Chicago	$19.50 to 20.00
St. Louis	17.50 to 18.00

BOILER PUNCHINGS

Chicago	$20.50 to 21.00
Eastern Pennsylvania	20.00 to 21.00

No. 605—A short glove made of chrome tanned leather, seams sewed with steel and palm reinforced with an extra leather patch and steel ribbons.

Per dozen pairs.....**$10.20**
or all lefts or all rights.

The "STEEL-GRIP IDEA"

The extra steel ribbon reinforcement on chrome tanned leather means a FLEXIBLE, PLIABLE, COMFORTABLE hand covering, affording the utmost hand protection and safety for the roughest work of shop, foundry, mill, scrap yard, smelter or whatever metal in any form is handled.

No. 644 — A four-inch gauntlet glove made of chrome tanned leather. Seams sewed with steel making them rip-proof. Palm and fingers reinforced with steel ribbons over strips of tough leather.

Per dozen pairs....**$15.00**
or all lefts or all rights.

No. 678—A chrome tanned leather steel sewed mitten made so it can be worn on either hand. No reinforcement except on thumb.

Per dozen pairs (24 mitts)
.....**$8.40**

YOU
Can't Go Wrong On This Combination

The Steel-Grip "605" and our special heavy duck apron. Chippers and grinders in the larger plants and many of the smaller ones, too, find this combination impossible to equal. They find that "605" will outwear a dozen pairs of canvas gloves, besides giving them positive protection against sharp and rough edges. The apron *wears* like *leather*. Welders wear them because they are fire-proofed and afford protection against sparks and excessive heat.

To the left are shown two other popular styles of Steel-Grip hand protection. On account of the heavy reinforcement "644," a four-inch gauntlet glove, is recommended for sand blasting. It provides positive protection from stinging sand and grit.

"678" is a reversible steel sewed mitten and is used mostly for handling and sorting metal in all forms such as castings, scrap, etc. This mitten can be worn on either hand, thus giving twice the wear of the ordinary mitten.

A heavy eight-pound duck apron, fire-proofed and asbestos-filled to preserve and lengthen its life and to afford body protection against sparks and extreme heat.

		Per Doz.
No. 100	24x30 inch	$15.00
No. 110	24x36 "	18.00
No. 120	24x42 "	21.00
No. 130	24x48 "	24.00

REMEMBER
WE ARE
HEADQUARTERS

For STEEL-GRIP gloves and mittens, moulders leggings, aprons, suits, asbestos gloves and mittens and all kinds of protective apparel. Write us your needs and we will be pleased to submit prices.

Steel-Grip Protection Can Be Supplied for the Price of One Small Accident

INDUSTRIAL GLOVES CORPORATION

Owners of HICKORY STEEL-GRIP GLOVE CO.

Box R-6 **CHICAGO, ILL.**

New Trade Publications

MOLDING EQUIPMENT.—Modern molding machines are described and illustrated in a 4-page cardboard folder being circulated by the Arcade Mfg. Co., Freeport, Ill. Jolt, roll-over molding machines, pouring devices, core jolters, piston machines and other foundry equipment is described and illustrated.

LOCOMOTIVE CRANES.—A 32-page illustrated catalog has been issued by the Buffalo Hoist & Derrick Co., Buffalo, in which locomotive cranes and parts are described and illustrated. Steel is used in the construction of all vital parts and all spur gears have cut teeth. The booklet contains a number of line drawings.

HANDLING EQUIPMENT.—Equipment for handling coal, ashes, sand, etc., is described and illustrated in bulletin No. 202 recently issued by the Lakeside Bridge & Steel Co., North Milwaukee, Wis. According to the booklet, one man and this equipment can move coal at the rate of from 30 to 60 tons per hour, depending upon the size of the bucket and the distance the equipment has to travel.

FANS.—The Massachusetts Blower Co., Watertown, Mass., recently published an 8-page condensed bulletin, in which all products of the company are briefly described and illustrated. Among the apparatus described are modified type squirrel cage fans, steel plate fans, propeller fans, mill exhausters, cone fans, heaters, air washers and portable service sets. The booklet contains some interesting data and several specifications.

TOOL AND ALLOY STEELS.—The Hammond Steel Co., Inc., Syracuse, N. Y., has issued an illustrated booklet of 48 pages in which tool and alloy steels made by the company are described. The booklet contains a number of tables including weights of rounds and squares, die block weights, heat colors, tempering range and hardening range. Among the illustrations is one of the company's plant at Syracuse showing the mills and main office.

HOISTING MACHINERY.—The Contractors Plant Mfg. Co., Buffalo, has issued to the trade a 30-page illustrated catalog, in which it describes and illustrates hoisting engines and equipment. These engines are built upon the duplicate part system and all parts are interchangeable. Single drum hoisting engines, double drum hoisting engines, triple drum hoisting engines and compound geared swinging engines are among those described.

COUNTERSINKING MACHINE.—Bulletin No. 201, issued by the Lakeside Bridge & Steel Co., North Milwaukee, Wis., describes and illustrates a reaming and countersinking machine. This machine consists of a movable trolley mounted on a boom, constructed of structural shapes, which in turn is supported on cast iron wall brackets. The length of the boom can be made to suit conditions. It has a wide range, takes up little space and when not in use can be swung out of the way. The trolley is rigid and moves from end to end of arm.

SHIP GANTRY.—The Lakeside Bridge & Steel Co., North Milwaukee, Wis., has issued a 4-page folder, in which it describes and illustrates gantry cranes for use in the shipbuilding industry. In the construction of these cranes, according to the booklet, special attention has been paid to simplicity in order to facilitate repairs and renewals with a minimum delay. The trolley truck bearings are of standard specifications with removable bronze bushings and large oil boxes. The hoisting drum is designed to take the full run of rope for specified lift without overlapping. The trolley is equipped with a special gear shift, operated from the cab, which permits three speeds in hoisting and lowering.

WELDING.—Methods of oxyacetylene welding as applied to the repairing of locomotive fireboxes are described and illustrated in a 40-page booklet recently issued by the Air Reduction Sales Co., New York. The data were compiled by George L. Walker and R. T. Peabody of the engineering department of the company. The booklet is not a catalog but rather a treatise on the application of the oxyacetylene process to locomotive shop repairs. Chapters in the book deal with full welded fire boxes, semi-welded fire boxes, semi-welded half side sheets, full-welded half side sheets, side sheet cracks, patches on firebox and flue sheets, etc. Each chapter is accompanied with a line drawing which is fully analyzed.

BRASS FURNACE BURNER.—An illustrated 8-page booklet has been issued by the Maxon-Premix Burner Co., Muncie, Ind., in which a furnace burner manufactured by this company is described. According to the booklet the burner mechanically mixes air and gas. It consists of a ball-bearing motor direct-connected to an aluminum impeller housed within a semisteel blower casing. The gas supply is through an inlet with an adjustable cock, which is operated together with a rotating shutter by a geared single lever for governing the air supply. A part of the casing is cast with a base upon which the constant speed motor is aligned and the switch mounted. The booklet is replete with illustrations, including a number of line drawings.

OIL FURNACE.—A 4-page bulletin has been issued by the Ingersoll-Rand Co., New York, in which an oil furnace for use in mines and shops for the heating of drill steel is described and illustrated. The main frame of this furnace is of gray iron mounted on a pedestal of the same material. The hood is in one piece and the drill rest can be easily adjusted for the various lengths of steel. The furnace is equipped with a plate for the protection of the operator, which shuts off the glare and reflects back the heat. This plate is carried by two adjustable steel rods. The burner is of the low pressure type and will operate on air supplies from a low pressure or high pressure source. Complete descriptions of the various parts of the furnace are given.

Opportunities Abroad

Information Can be Obtained From the Bureau of Foreign and Domestic Commerce. Requests Should be on Separate Sheets and Should be Accompanied by Opportunity Number

Raw materials for the manufacture of steel cables are required by a party in Belgium. Correspondence should be in French. Opportunity No. 29484.

Machinery to be used in the manufacture of overalls and textiles are required by a firm in Norway. Opportunity No. 29492.

The purchase and agency for agricultural machinery are required by a co-operative farmers' organization in South Africa. Opportunity No. 29615.

The purchase and agency for electrical machinery, motors, copper wire and cable, vehicles, office supplies, engineering and building equipment, are required by a firm in Norway. Opportunity No. 29617.

A party in Italy desires to represent American manufacturers in gasoline engines for motor cars, electric generators and other electrical material. Opportunity No. 29632.

Mechanical and labor-saving devices for lignite mining and transportation, also in engineering appliances and machinery for preparation and utilization of lignite in all forms, are desired by the Ministry of National Economy of a European country. Opportunity No. 29634.

A firm in Belgium desires to purchase or act as agent or receiver on consignment of tramway equipment, traveling cranes, electrical material, motors, illuminating and insulating material and telephone and other special equipment. Opportunity No. 29656.

An agency is desired by a business man in England for the sale of machinery, machine tools, machine shop and foundry supplies and metals. Opportunity No. 29659.

The purchase of 10 machines for sewing grain sacks and two machines for cutting sack material is required by a manufacturer in Argentina. Opportunity No. 29645.

A firm in Belgium desires to purchase enameled iron bath tubs, wash stands, water fittings, kitchen sinks, etc. Correspondence should be in French. Opportunity No. 29647.

A merchant in England wishes to purchase outright, tools and machinery suitable for the use of manufacturing jewelers. Opportunity No. 29648.

The purchase of lathes and other machine tools to be supplied to coal mines and arms factories, and compressed air-drills for coal mines, is desired by an importing firm in Belgium. Correspondence should be in French. Opportunity No. 29649.

A building contractor in British East Africa desires to purchase one 14 x 16-inch saw, bench rising and falling table; one 36-inch saw bench; one vertical spindle; one chain mortiser; one drilling machine; one power grindstone; one set of emery wheels on spindle; one band saw; one planer under and over; shafting; pulleys and motors to drive same and to include belting; one small stone crusher; one cement block machine and a small concrete mixer. Opportunity No. 29650.

Machines for the cutting and fashioning of cardboard are desired by a firm in Belgium. Correspondence should be in French. Opportunity No. 29702.

The purchase of motor launches of 10 to 12 horsepower, shallow draught, suitable for fresh water lakes in the tropics, is desired by a party in India. Opportunity No. 29703.

A company in Ireland wishes to purchase axles and springs primarily for 2-wheeled vehicles. Opportunity No. 29705.

The purchase by a company in India of electrical industry supplies, gas and electric fixtures, iron steel boilers, various metals, shipbuilding materials, engines, electrical cable-making machinery, flour-mill machinery, motion picture machinery, and other electrical equipment is desired. Opportunity No. 29687.

Shipping and pulling chains and anchors are required by a party in Greece. Opportunity No. 29690.

Machinery and supplies of all kinds for the equipment of a modern silk-spinning factory is desired by a party in France. Correspondence should be in French. Opportunity No. 29691.

The purchase of emery wheels is desired by a party in Italy. Correspondence should be in Italian. Opportunity No. 29693.